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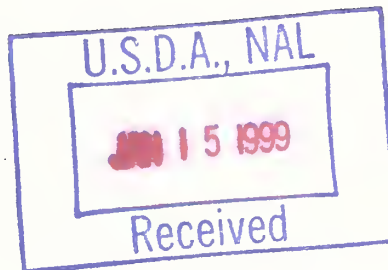
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ARCHEOLOGICAL INVESTIGATIONS  
IN THE  
CAVE CREEK DRAINAGE  
TONTON NATIONAL FOREST, ARIZONA



By  
- William G. Holiday

Report No. 1

USDA Forest Service  
Southwestern Region  
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### Note

This publication is the first of what we trust will be a continuing series reporting the results of archeological investigations on National Forest lands in the Southwestern (Arizona and New Mexico) Region. Under the Multiple Use Act the Forest Service is directed to insure that the resources on National Forest lands are managed to the benefit of the American people. In terms of the archeological resource, this means that information about the past can no longer be left languishing in notebooks and on storage shelves. We must make available to the American people the results of archeological studies on National Forest lands and this publication series is a modest effort in that direction.

I am most grateful to William D. Hurst, Regional Forester, for his foresight in implementing an archeological program in the Southwestern Region. The continuing support of the Division of Recreation and Lands is also very much appreciated.

The cover design is by William M. Larsen, Landscape Architect, USFS Southwestern Region. The figure is from a petroglyph which I discovered with Robert C. Euler during a recent survey of Havasu Canyon, Kaibab National Forest.

Dee F. Green  
Regional Archeologist



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ARCHEOLOGICAL INVESTIGATIONS IN THE CAVE CREEK DRAINAGE,  
TONTO NATIONAL FOREST, ARIZONA

By William G. Holiday

Abstract

This paper reports the results of an archaeological survey conducted along the thirty kilometers of Cave Creek, Arizona. Four complexes of sites were found at intervals along the creek. Eight kinds of sites comprised the mix within these complexes, with five of the eight being observed at each complex. The eight kinds of sites were: Dry Farm, Irrigated Far, Field House, Pueblo, Compound, Hilltop Fort, Bed Rock Metate, and Petroglyph.

Ceramic cross dates suggest the complexes were occupied during the time period of Classic Hohokam. The Cave Creek Retention Dam and Paradise Valley complexes have considerably more cultivated land than would be required to support populations of the size indicated by habitation sites. Conversely, the Cave Creek and Skull-New River Mesa complexes have habitation sites suggesting populations considerably larger than could have been supported by the available arable land and collecting/gathering potential. The hypothesis is developed that the peoples established permanent quarters where permanent water was available despite little or no arable land and commuted to sites with extensive agricultural acreage for part of the year in order to farm.

Comparison with data from other archaeological surveys in the area seem to rule out cultural affiliation with Hohokam, Salado and the Anasazi but suggests possible affiliation with the Sinagua.



## Introduction

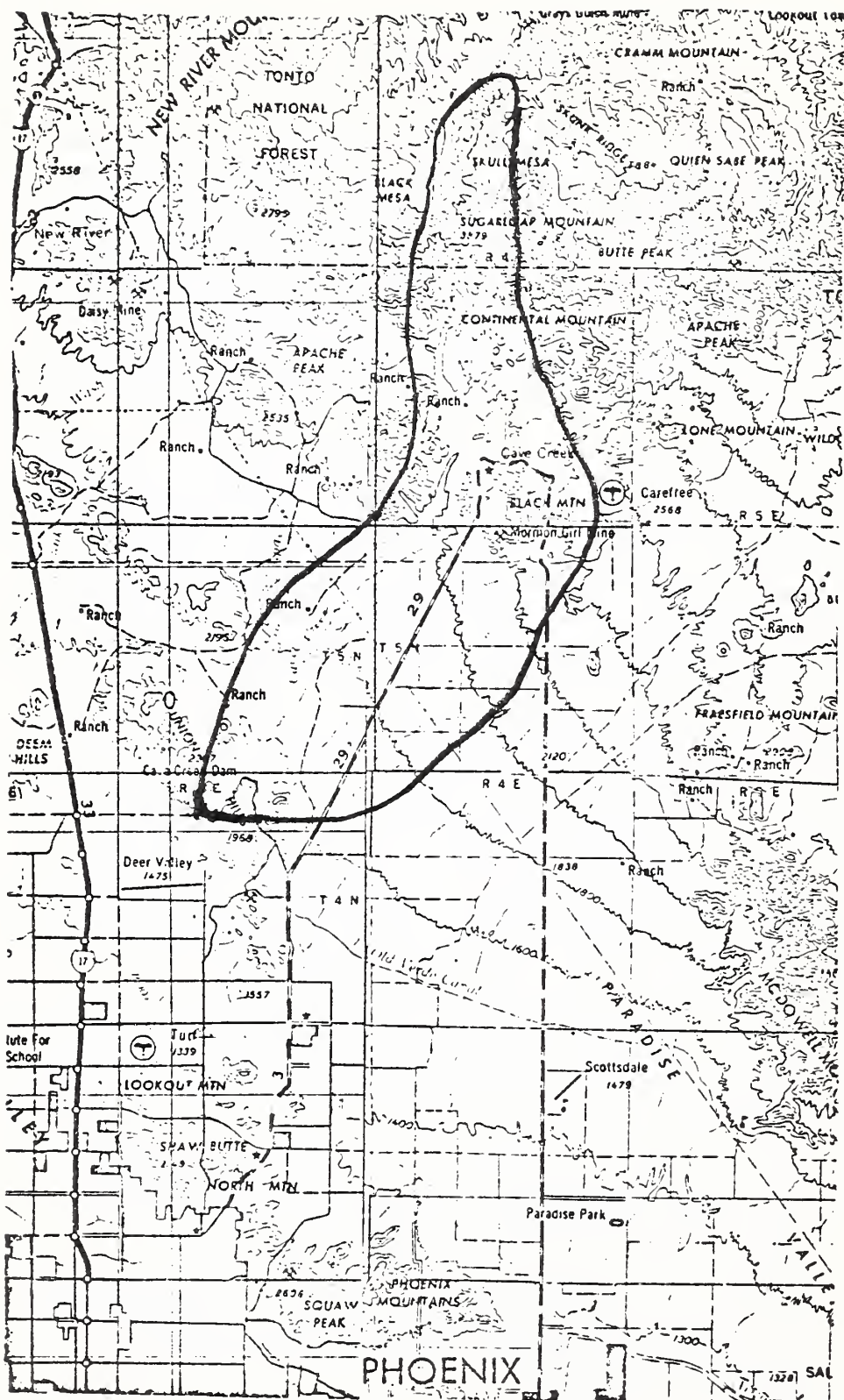
This paper is based on the results of an archaeological surface survey which covered approximately thirty km. of Cave Creek, Arizona, and its related drainage. The survey began at the Cave Creek Retention Dam a short distance from its southern end where it disappears into the Arizona Canal and ended in the mountainous country of the Tonto National Forest where its headwaters rise north of Skull and New Rivers Mesas. It will be noted from the map (figure 1) that this particular drainage lies between the Verde River on the east and New River to the west. The drainage itself is independent of these two rivers and follows its own course into the Salt River via the Arizona Canal.

The first portion of the survey at the Cave Creek Retention Dam was originally started as a cultural inventory project by archaeological graduate students from the Department of Anthropology at Arizona State University in the spring of 1971. The distinctive character of the remains determined by that survey, when compared with sites along the nearby Salt and Gila Rivers, highlights a series of questions that have been posed by earlier investigations in this zone. These earlier studies are discussed in Chapter III.

The current survey was undertaken in order to evaluate the cultural manifestations that might be found in the rest of the Cave Creek drainage, with the realization that the drainage itself was distinctive from its neighbors, the Verde and Salt both being permanent streams flowing the year around. Special emphasis was placed on defining and determining the aerial location and dimensions of the settlement patterns in the drainage. At the same time it was proposed to examine a number of hypothesis that would arise from such studies and possibly arrive at proposals that would permit the testing of the resulting hypotheses.

Since the Cave Creek Retention Dam survey, conducted earlier, revealed a number of cultural manifestations not normally associated with Hohokam remains found in the vicinity, this survey was conducted with the following hypotheses as possibilities for investigation:

1. Can the evidence be considered to represent a variation of river-based Hohokam? In this case reliance is placed on the definitions of river-based Hohokam as outlined by Gbadwin et al (1965:264) and Haury (1945:205).
2. Or, does the cultural inventory result in a classification of a regional manifestation of Sinagua? Sinagua is used here in terms of Colton's (1946:303) and Schroeder's (1953:80) definitions.



Cave Creek & Adjacent Drainages

Scale 1:250,000

3. Alternatively, is there a possibility of the existence here of a unique upland pattern not currently adequately defined? Chenhall (1967:53) uses the term "red-ware-mountain top-pueblo complex" as an attempt at a name-tag for such manifestations.
4. Due to the proximity of Cave Creek to Hohokam and Sinagua remains, is there evidence of the peoples involved being affected by interaction with their neighbors?

No attempt was made to survey the four miles south of the Cave Creek Retention Dam to the point where it enters the Arizona Canal since this portion of the creek is in the city limits of Phoenix where residential construction and gravel pit operations have eliminated any possibility of prehistoric remains.

As mentioned earlier, the Cave Creek Retention Dam portion of the survey was conducted by graduate students from the Arizona State University as a class project for the purpose of preparing a cultural inventory for an area about to be disturbed by the construction of the new dam. The surveying technique in this case involved collecting all the surface pottery and lithics, including debitage that could be recognized as such.

Progressing north across Paradise Valley, the survey was conducted by four-wheel drive vehicle. Both sides of the creek were explored laterally for a distance of approximately three km. both east and west. This was a relatively easy task due to the silted alluvial nature of the soil. In addition, the banks of both sides of the creek were explored on foot for a distance of approx. 300 meters laterally from the creek bed. Due to the meandering of the creek over the years, sites that may have existed have long since been destroyed. Only at the northern part of Paradise Valley were sites found and these were adjacent to the creek. The survey techniques used were concerned with determining the nature and extent of the cultural manifestations. Representative samples of pottery and lithics were selected at random. Random pottery sherd selection was relatively easy since Wingfield Plain was, with a few rare exceptions, the only king in evidence. However, all pottery sherds other than Wingfield Plain were collected.

Once Paradise Valley was passed and the mountainous region to the north was entered, the procedures used in surveying had to be revised. Through the forest ranger's station at Cave Creek it was ascertained that aerial photographs in overlying stereographic strips were available from the United States Department of Agriculture for the entire Tonto National Forest. Copies were secured for that part of the Cave Creek drainage that lies within the Tonto National Forest. Even though the photographs were of a scale

of approximately 1:12500, prehistoric settlements were visible through a three dimensional viewer. Enlargements were obtained from the Forest Service for that part of the forest being covered by the survey. These enlargements were to a scale of 1:7000 and were used as a basis for aerial reconnaissance in a light plane in order to accurately pinpoint the possible site locations.

The more inaccessible sites at the top of Skull Mesa and the higher benches overlooking Cave Creek were visited by helicopter. Since the length of stay at each site was restricted to about an hour each, surface collections of pottery sherds and lithics were restricted to representative samples. Again, Wingfield Plain was the predominant type found. All pieces of Gila Red and Salt Red that could be seen were also collected. The lower bench sites and two of the mountaintop sites were reached by climbing after approaching as close as possible by four-wheel drive vehicle. Difficulty of access again restricted the amount of artifactual material that could be returned for analysis. All pottery sherds and lithics collected from the entire survey were prepared for identification and deposited with the ceramics laboratory at Arizona State University.

## CHAPTER I

### Environment

#### Climate

The Cave Creek draipage lies within the Sonoran desert biotic province. Primarily, the Sonoran desert is recognizable as such because of its distinctive vegetation (Dunbier 1968:4) but it is also indirectly a climatic province, since climatic conditions are the responsible conditioning agents that account for this vegetation.

According to Seller's charts (1964:9) the Cave Creek drainage lies in that sector of the Sonoran desert receiving twenty-five centimeters of rain or less per year. This meager fall occurs in two well defined rainy seasons. The first being winter which usually begins in November, continuing intermittently into March. The second is summer and lasts from July into early September. The summer period is characterized by brief intense cloudburst showers. Under climatic conditions today, the average rainfall pattern provides a greater quantity of rain in the summer season than in the winter and can be referred to as a summer dominant rainfall pattern.

Summer rains are usually of localized storm cloud origin covering but a few square kilometers in area. As a result, the dominance or preponderance of summer over winter rainfall varies widely from one part of the desert to another, and may not even be consistent from one year to the next. It is possible for a particular portion of the desert to experience a long series of drought years despite regional averages indicating normal precipitation. Dunbier (1968:22) cites the example of a thirty year average rainfall in excess of twenty-five centimeters with some individual reporting stations in the same locale during the same period receiving but seven to ten centimeters several years in a row.

The summer normal maximum daytime temperature in the Cave Creek area exceeds 55 degrees C for extended periods. It is difficult to produce definitive documentary evidence to support these temperatures since weather statistics have only been collected at the Carefree Airport since 1969. A weather station did collect some statistics in the Cave Creek itself before 1969 but only for a few years. None of the data collected there has ever been resolved into maximums, minimums, or averages. A cursory inspection of the Carefree Airport data indicates that it is relatively comparable to equivalent statistics for Bartlett Dam, some 18 miles east of Cave Creek, as well as for Phoenix itself. Although there is a

difference in altitude between these locations, topography seems to have a leveling effect, at least in the summertime temperatures. Both Bartlett Dam and Phoenix weather statistics represent long range averages.

The following statistics have been selected from the climatological reports published by Sellers (1964:91 & 317):

Daily Maximum Means in Degrees C.

| <u>Bartlett Dam</u> |      | <u>Phoenix</u> |
|---------------------|------|----------------|
| 50.4                | May  | 50.7           |
| 55.5                | June | 56.1           |
| 58.1                | July | 57.5           |
| 56.8                | Aug. | 56.3           |

Any statement of climate must include reference to temperature variations not only between diurnal summer and winter but night and daytime as well. Bartlett Dam statistics are not relevant to this regard because the winter minimum temperatures there are influenced by the body of water present which has a tendency to keep the minimums higher than would normally be the case in the rest of the desert. Using Phoenix statistics as cited by Sellers above, the diurnal variations between summer and winter range from 17.8 to 20 degrees C., while the variation between maximum means and minimum means during the four summer months of May, June, July and August range from 14 to 16.7 degrees C.

Altitude plays an important part in determining the magnitude and range of these temperature variations. Loew (1964:85) cites a 2.2 degree C. decrease for each 308 meters rise in altitude while Sellers (1964:25) prefers the same decrease spread over a vertical variation of 290 meters. Since these figures are averages, actual variations can be more or less than the cited figures.

The survey began at an elevation of approximately 370 meters at the point where Cave Creek joins the Arizona Canal. Over the thirty km. involved in the survey, the elevation of the creek bed rises to 850 meters, with the sharpest gradient occurring in the last nine km. At the upper reaches of the creek the benches suitable for habitation lie in a range of altitudes from 850 meters to 970 meters. The highest elevations surveyed were on the top of Skull Mesa overlooking the creek to the west with an elevation of 1280 meters. Since the total altitude variation in the area surveyed is approximately 910 meters, it would be reasonable to look for a temperature differential of approximately 6.6 degrees C. from one end of the creek to the other.

## Vegetation

The flora of the entire distance surveyed is remarkably consistent, other than at the top of Skull Mesa itself. This part of the Sonoran desert has been described by Loew (1964:11) as a distinct biotic entity or community, comprising an ecological formation he calls desert scrub. He then breaks down this description into life zones. The Cave Creek drainage would fall into what he calls Lower Sonoran. Skull Mesa at the 1230 meter elevation would then qualify as a transition zone between Lower and Upper Sonoran.

However, Jaeger (1957:63) prefers the name Arizona Upland or Sahuaro Desert. This term allows definition in terms of the extent of the Sahuato cacti found from the 600 to 1200 meter elevations. This classification appears to be much too general, as it ignores vegetation variations within the elevational range. Creosote bush, bursage, and several varieties of cacti seem most prevalent in the lower reaches of the creek, while ironwood, sahuaro cacti, and palo verde mixed with mesquite, jojoba and ocotillo are more common on the higher more rocky terrain. Windswept Skull Mesa is covered with grasses with an occasional agave or yucca along with prickly pear cacti.

Grasses are characteristically absent throughout the entire drainage due to extensive cattle grazing operations. Cattle can be seen at all elevations of the creek--even on top of Skull Mesa and New River Mesa to the west. Dunbier (1968:58) suggests that over-grazing provides opportunity for the creosote bush and mesquite to invade and replace grasses. If overgrazed through time, the aspect of the vegetation during prehistoric times could be somewhat different than the one seen today.

## Topography

The survey area can be divided into two geographical zones. The first fifteen km. is characterized by silted alluvial bajada soil. This section comprises the southern end of the creek from the Arizona Canal north through the area now occupied by the Cave Creek Retention Dam and on across Paradise Valley to where the creek emerges from the mountainous area north of Black Mountain. Along this section of the creek the benches adjacent to the creek, where silting has occurred, are suitable for the development of irrigated agriculture. Flood water in the creek could be diverted and/or directed onto and readily drained off such benches. Benches at slightly higher levels are more gravelly and more frequently have rock and boulder outcroppings. It is possible in prehistoric times that these higher benches had some top soil which has since been eroded away as a result of subsequent summer storms.

Whether this lower section should be referred to as a lower bajada or upper bajada depends on definition of those terms. Martin (1963:1) identifies a lower bajada as one that typically overlies deep fill while an upper bajada is one that sits on top of bedrock and may be mantled by a well drained gravelly soil. So defined, the lower portion of Cave Creek should be termed an upper bajada. Such narrow valleys as are drained by Cave Creek should typically have only upper bajada deposits. In any case, extreme dissection is present, but a typically gravelly soil mantle is not observed.

The soils in the benches along the creek suitable for irrigated farming are all of an alluvial-colluvial sandy silt nature. They have been deposited as overflow from the flood stages of the creek. Many of these silted areas are a mix of sandy loams that seem to retain moisture even in the drier months. In this lower stretch of the creek the gradient is relatively flat. It only falls from 600 meters to 450 meters in fifteen km. for an average of ten meters per km. The creek bed itself is deeply eroded and paved with gravel ranging in size from fist size to boulders weighing many tons. All sizes of the creek cobbles are smooth, reflecting the grinding action of tremendous forces of water. This creek bed condition is characteristic of the upper reaches of the creek as well.

The next fifteen km. upstream, north of Black Mountain is characterized by steep walled canyons with the benches marching up from the creek bed on either side at 150 meter heights from one to the next. Mineral outcroppings are evident from the large number of abandoned mine shafts that can be seen in the stratigraphy of the cliffs that rise up to Skull and New River Mesas.

In this upper section of the creek the gradient becomes so steep that such silted areas as do exist are limited to one-half hectare or less in size and are subject to severe flooding from summer rains. The gradient over 13.5 km. covers a rise of 250 meters. This is almost twice the gradient observed downstream. However, at the 850 meter level the elevation then rises abruptly on each side of the creek within the span of 1.5 km. to approx. 1,280 meters. Due to the rocky surface present, very little if any agricultural activity would have been possible.

#### Water Resources

Cave Creek has standing and/or running water all year at the higher elevations. Here springs trickle from the sides of the cliffs and feed the creek without regard to rainfall conditions. At the Paradise Valley portion of the survey no discernible water could be seen in the creek except after heavy rains during the summer.

The settlements in the upper reaches of the creek are characterized by a more permanent type of construction. They would appear to exemplify Haury's contention (1956:4) that the dispersal of peoples in this region was determined purely and simply by water regardless of the physiographic province. This would mean that village size settlements would be limited to sites along living streams or near permanent springs. The results of this survey certainly suggest that this is correct.

The prerequisite of arable land for subsistence purposes would thus be of a secondary nature to water. However, regardless of priority, both must be present for permanent settlement. The running water at the higher elevations and the arable land at the lower seems to suggest a balanced biotic province.

A present day ethnological example of these circumstances is best exemplified by the Papagos. Dunbar (1968:104) cites Castetter and Bell (1942) wherein the Papagos are seen to migrate in the winter months to mountainous areas where water is available and then proceed to their distant fields in the summer. In that example, the winter migration is the sole result of seeking drinking water.

Although care has been taken in this discussion to avoid translating the climate of today into what might have been in the prehistoric past, the running water in the upper reaches of the creek seems to be one condition that has existed for many centuries..

#### Agricultural Potential Factors

It is interesting to contrast the relative potential for both agriculture and collecting/gathering in the first fifteen km. of the survey measured against the same potential in the remaining fifteen km. The first portion of specifically Lower Sonoran in character with an agricultural potential of much greater magnitude than the upper reaches of the creek which are more of a transition zone to Upper Sonoran. Upstream, the potential for both agriculture and collecting/gathering is severely restricted due to the mountainous rocky nature of the terrain.

The Paradise Valley sector in the south contains hundreds of hectares suitable for irrigated agriculture, subject to creek water being available for distribution to its surface. However, the stream bed today lies some ten to fifteen meters below the level of those silted areas showing evidence of prehistoric irrigation. A higher stream bed level would have afforded considerably larger irrigated agricultural acreage than can be seen today.

It would be difficult to estimate just how much arable land in the Paradise Valley portion of the survey was available and so used by the prehistoric peoples since channel cutting over the intervening years must have been of a high magnitude.

The vegetation types present today could provide a valuable subsistence pattern of collecting/gathering activities at all elevations of the creek as a supplement to irrigated and dry farm agriculture. Existence of the bed rock metates/mortars establishes evidence of the extent of this activity. It would be convenient to place special ethnological significance to these bed rock grinding stations. However, it seems obvious that the most convenient place to grind up the fruits of collecting would be at the scene rather than wait until the gatherings could be transported back to the area of habitation.

In addition to its mountainous nature, the increase of altitude on the upstream portion of the creek must be taken into account when assessing its agricultural potential. Changes in altitude can alter drastically the number of frost free days available for growing crops, the amount of local rainfall, and the temperature differential from summer to winter. The last spring killing frost, for example, is ten to fifteen days later for each 300 meters rise in elevation (Lowe 1964:86). This applies likewise to the length of the frostless season with approximately thirty days less for each 300 meters rise in altitude (Dunbier 1968:58). Some form of prehistoric agricultural activity was indicated, however, at all site complexes encountered in the survey. It should be kept in mind, however, that the irrigated agricultural activity seemed to have been confined to the lower elevations. It would be dangerous to interpolate the length of the growing season at the top of Skull Mesa from data collected at neighboring locations with the same altitude. For example, Globe with an elevation of 1076 meters has a growing season of 228 days (Sellers 1964:205).

A relationship exists between rainfall and temperature to the extent that as mean annual temperature decreases the mean annual precipitation increases. Combining this phenomenon with the length of the growing season as it varies with the length of frost free periods, the result should be a standard formula that would confirm this situation. However, when the different physiographic conditions at each altitude are properly evaluated, the derivation of such a formula becomes very problematical. Hack(1942:7) ran into this problem when he tried to apply frost data from the Navajo country in a quantitative way. Since there are no relative statistics in this regard for the Cave Creek area, any attempt to propose conclusions about the optimum agricultural activity that may have taken place at each elevation would be simply conjecture. At best, the relationships between rainfall, elevation and temperature as they affect vegetation can only be described by indicating that slight changes in each will cause alterations in the growth pattern. Since we have no quantitative knowledge of the local Cave Creek temperature and rainfall patterns during prehistoric times, inferences as to the

agricultural pattern existing during these times should not be attempted other than to venture that the variables incumbent with the differences in altitude indicate a greater crop potential at the lower levels.

A more important aspect than rainfall statistics concerns the amount of moisture retained in the soil. Dunbier (1968:33) is able to show that rainfalls under thirty eight centimeters per year have little effect on the amount of moisture in the soil available to support crop development. Lowe (1964:88) goes so far as to relegate rainfall to a position of relatively little or no importance in assessing vegetational potential in the Arizona deserts. He contends that the rate of evaporation compared with soil moisture comprises a much better measure of whether agriculture can or cannot succeed. His argument is that evaporation is largely a function of air temperature gradients. Thus, the combination of air temperature and soil moisture essentially determines the outcome of any planting effort. It would then follow that a knowledge of the extremes of rainfall from year to year and their effect on plant available soil moisture is more important than the effect of altitude on rainfall which Lowe confirms (1964:88) as being approximately 12.7 centimeters per 304 meters change in altitude. However, Lowe is obviously referring to agriculture without the benefit of irrigation as such since soil moisture would be artificially kept at a high level under such circumstances.

## CHAPTER II

### Survey Results

Thirty-six individually distinct sites were found along the thirty km. of Cave Creek included in this survey. Many of the sites were composed of a number of features and/or components. For the purposes of this paper such features and/or components have not been separated out for individual descriptive attention. Should detailed mapping or excavation be carried out at a later date, additional site numbers and possible component designations may very well have to be assigned due to the complexity and over-lapping of attributes at each site.

For descriptive purposes, the features within the thirty-six sites can be defined in terms of the following eight categories:

1. Irrigated Agriculture
2. Dry Farming
3. Field Houses
4. Compounds
5. Pueblos
6. Hilltop Forts
7. Bed Rock Metates
8. Petroglyphs

While the descriptions and locations of similar sites in the southwest archaeological literature are outlined in Chapter III, the following general descriptions will clarify and define the basic meaning of the terms as used here.

Irrigated Agriculture refers to the use of creek or river water by diversion canal to the upstream side of the fields being irrigated, with feeder channels from the diversion canal directing water to individual plots. The irrigated fields located along Cave Creek were delineated into plots by means of river cobbled stone markers.

Dry Farming agriculture, as contrasted to irrigated, employed the use of runoff rainwater from adjacent slopes rather than diverted

water from the creek. In every case, the plots so irrigated are no more than a few meters in dimension on each side. The boundaries are outlined by rock cobbles. They seem to be located adjacent to or in close proximity to habitation sites. As will be discussed later, these plots are often referred to as "garden" plots or in the case of a network of such plots, the term "waifle garden" is sometimes applied.

Field Houses are small single room habitation units, often in clustered groups, located close to irrigated and dry farm agricultural sites. They are of shallow depth as the normal desert pavement can be seen in the interior floors. Artifacts found in and around these sites usually consist of a few sherds of plain pottery with possibly a broken stone tool or two. Seasonal occupation with a minimum of household goods is indicated.

The use of Compound as a descriptive term is applied to those habitation sites of a seemingly permanent nature where a wall surrounds a number of single or contiguous rooms. An interior plaza or open space is present and a discernible entrance opening is recognizable. The compounds located by this survey used river cobbles as walls.

All the Pueblos located during the course of this survey are situated in defensive positions not adjacent to or in the proximity of land suitable for agricultural purposes. Each was characterized by walls of fitted stone work enclosing contiguous rooms with common walls. As many as fifty rooms to a site were common. One larger room than the rest seemed to be common to all the Pueblos located.

The use of Hilltop Forts as a descriptive term is somewhat unfortunate and is not strictly in keeping with the circumstances. As will be seen in Chapter III, this nomenclature has been applied to similar sites by others in the past and until a better and/or more suitable term can be determined, it seems prudent to continue its use to avoid further confusion. These fort-like sites are located on isolated peaks or crowns of hills overlooking habitation sites. They consist of walled structures with the walls so placed as to make them almost inaccessible from any direction. Some have rooms inside the confining wall. Artifacts such as pottery sherds are either not in evidence or very scarce.

Petroglyph locations follow no set pattern. They can be found inside Pueblo walls, adjacent to metate grinding stations and in isolated places not associated with any discernible prehistoric activity. Superficial inspection of the subject matter portrayed reveals no obvious pattern of pictorial consistency.

Bed rock metates consist of grinding stations located in bed rock adjacent to areas suitable for agricultural and/or gathering/collecting purposes. Those located by this survey were all multiple station sites reflecting a community effort.

From a geographical standpoint, the same thirty-six sites can be spatially grouped into four concentrated locations. This does not mean that additional sites may not have been present originally elsewhere along the creek. Though sought, none were observed. Perhaps wandering of the creek bed and human depredations have eliminated visible signs of human occupation in between the four site complexes.

Each of the four groups have at least five of the eight categories with its boundaries. For descriptive purposes, these four geographical groups are designated:

1. Cave Creek Retention Dam
2. Paradise Valley
3. Cave Creek
4. Skull-New River Mesas

The maps (Figs. 2, 3, 6, 8) pinpoint these locations.

Due to construction work currently under progress at the site of the Retention Dam itself, plus the depredations of pot hunters, dune buggies and motorcycle drivers, the Cave Creek Retention Dam sites are very close to complete destruction. The four mile stretch from the Cave Creek Retention Dam north to the next group of sites referred to as Paradise Valley, was surveyed for at least 1.6 km. both east and west of the creek bed. Wandering of the creek bed through time and the alluvial silting of Paradise Valley itself seems to have destroyed any archaeological evidence that might have existed from the past. It is only to the north where the creek passes between Black Mountain and the surrounding hills and begins to cross Paradise Valley that remains can be found. Pot hunters have been active here and it is merely a question of time before the sites in this section are also obliterated. This is true, irrespective of antiquities legislation protective of sites lying on State land. The new Cave Creek High School is due to be erected on the east bank of the Creek opposite AZ T:4:28 (ASU). Without doubt, this construction will help to hasten the ultimate loss of this group.

For five miles north from this group of sites to the Cave Creek group, the creek passes through the present day village of Cave Creek. Local inhabitants, ranching and mining operations have again made any assessment of prehistoric occupation impossible over this stretch of creek. Although the local residents are co-operative in their efforts to help locate remains, they have trouble in remembering the locations of signs of habitation. The artifacts that they have collected are now out of context, making it difficult to evaluate their importance correctly. However, once the Cave Creek sites are reached, the terrain becomes mountainous and extremely difficult to traverse. The sites in this group and those in the Skull - New River Mesa sector to the north are the best preserved. The Cave Creek group sites are on private property while the Skull - New River Mesa group are within the confines of the Tonto National Forest.

The sites in the Tonto National Forest are on benches that rise very steeply from the creek bed. With an elevation of 760 m., approximately 150 m. jumps to a 1270 m. elevation on the mesa tops. This portion of the survey was conducted by helicopter since horse-back travel is difficult and access from the creek bed to the benches by four-wheel drive is impossible. The drive up the creek bed to this point is only possible during the drier months of the year as there is some water flowing in the upper reaches of the creek almost continuously. Visits to the Skull - New River Mesa sites even by helicopter is restricted to the early morning due to the varied and unpredictable up and down draft air currents that seem to wander from one side of the canyon's walls to the other. The writer experienced the problem here in a light plane while trying to spot ruins on the west bank of the creek. Fortunately, the plane recovered and was flown back to the Carefree Airport, despite the loss of landing gear.

Since each of these four site groupings lends itself to discussion as an individual group, the following site summaries and aerial photographs have followed this arrangement.

The maps illustrated are from standard U. S. G. S. 7.5 minute topographic quadrangles and the aerial photographs of the Cave Creek and Skull - New River Mesa groups were obtained from the U. S. Dept. of Agriculture Forest Service photographic laboratory at Ogden, Utah.

#### Cave Creek Retention Dam

At this locale, the eight sites listed seem to comprise a balanced unit of habitation and agriculture. Six of the eight categories identified in the survey are represented here. Missing are Pueblo-

type ruins and bed rock metates. Since the Pueblo-type ruins are usually built on the edge of bluffs in protective situations, none would be expected given the local topography. The absence of bed rock metates should not be considered to have any particular interpretative significance. Metates of any kind have long since been removed by pot hunters although a few manos were included in the lithics collected at the sites.

Since this portion of the survey was done for cultural inventory reasons in connection with a salvage archaeology project, all the pottery sherds and lithics that could be seen on the surface were collected. A lack of painted pottery sherds at this locale may be attributable to the extensive pot hunting that has taken place. However, the technique of collecting all visible pottery was not followed at the rest of the site complexes due to inaccessibility of many of the sites and the very large quantities of pottery sherds present making it difficult to retrieve these artifacts from a practical standpoint. In such cases a selective sampling process was more appropriate.

A few painted sherds found were identified and considered to be Classic Hohokam with regard to time, and due to their limited numbers, should be relegated into the category of trade goods, rather than local manufacture. Subject to excavation and detailed study, the time period involved should be placed somewhere around A. D. 1200.

The combination of irrigation and dry farming techniques in evidence indicate peoples who were attempting to exploit the environment to the fullest extent possible with limited technical knowledge. They were using every available plot of ground that was capable of having water diverted to it for crop growing purposes. For example, channels were formed on one side of the 125 meter hill overlooking the habitation sites by arranging boulders to ensure rain water being diverted to the garden plots.

To postulate contemporaneity for all the sites in this complex, in the light of the evidence so far established, would be premature. An overview does, however, lend credence to the concept of a self-contained community engaged in a variety of endeavors with agriculture being the most prominent.



TABLE I

## Site Summary

## Cave Creek Retention Data

| Site No.        | Kind of Site                    | Size and Relative Position   | Ceramics/Lithics   | Other   |
|-----------------|---------------------------------|--|--|---|
| AZ T:8:31 (ASU) | Habitation and Agri-cultural    | Scattered over area 200 meters by 50 meters. West bank of Cave Creek                           | Wingfield Plain and one sherd Casa Grande Red-on-buff                                | Both irrigation and dry farming evident. Two habitation components present. |
| AZ T:8:32 (ASU) | Habitation and Garden Plots     | Two components of rooms plus one of garden plots. West bank of Cave Creek                      | Wingfield Plain and one sherd Casa Grande Red-on-buff                                | Dry farming by collecting hillside runoff water.                            |
| AZ T:8:33 (ASU) | Habitation                      | Four rooms. Adjacent to T:8:32   | Wingfield Plain  | Walls of rooms dry stone river cobbles.                                     |
| AZ T:8:34 (ASU) | Fort with rooms and petroglyphs | 100 meters by 25 meters on top of mountain overlooking T:8:31-38.                              | Wingfield Plain  | Four boulder rooms inside walls. Walls still two meters high.               |
| AZ T:8:35 (ASU) | Agricultural with field houses  | Stretches around base of hill under T:8:34 for .8 km. on west side. Garden plots--dry farming. | Wingfield Plain and Salt Red. One sherd Sacaton Red-on-buff.                         | Small garden plots ringed with stone borders using hillside runoff.         |
| AZ T:8:36 (ASU) | Petroglyphs                     | At creek bed level on east side of hill under T:8:34   |  | Fifteen groups--mostly man/animal figures--some geometric designs.          |
| AZ T:8:37 (ASU) | Collecting/gathering            | East bank of creek north of T:8:35   | Wingfield Plain and few sherds Casa Grande Red-on-buff,                              | Seems like gathering site. Desert vegetation heavy in vicinity.             |
| AZ T:8:38 (ASU) | Habitation                      | Approx. 15 rooms covering area 100 meters by 50 meters. East bank of creek opposite T:8:31.    | Wingfield Plain-Salt Red. Few sherds Casa Grande Red-on-buff manos and hammerstones. | Room walls outlined by river cobbles.                                       |

## Paradise Valley

This group of sites is spread along both sides of the creek for a distance of approximately 2.5 km. just as the creek begins its journey across the silted expanse of Paradise Valley. As in the Cave Creek Retention Dam sector, Pueblo-type ruins are missing but here the river cobble boulders do not lend themselves to Pueblo-type construction nor are there defensive type bluffs suitable for their location. Petroglyphs are also missing, but local residents advise that petroglyph covered rocks have been hauled away as souvenirs from this area in the past, until today there are none left.

The apparent absence of a fort does not mean that one does not exist on one of the surrounding hills. None could be seen from the air nor from the aerial photographs of the area. The mountain climbing effort to investigate each hilltop simply was not warranted. However, there is more agriculturally developed land in this group than at any of the other groups of sites.

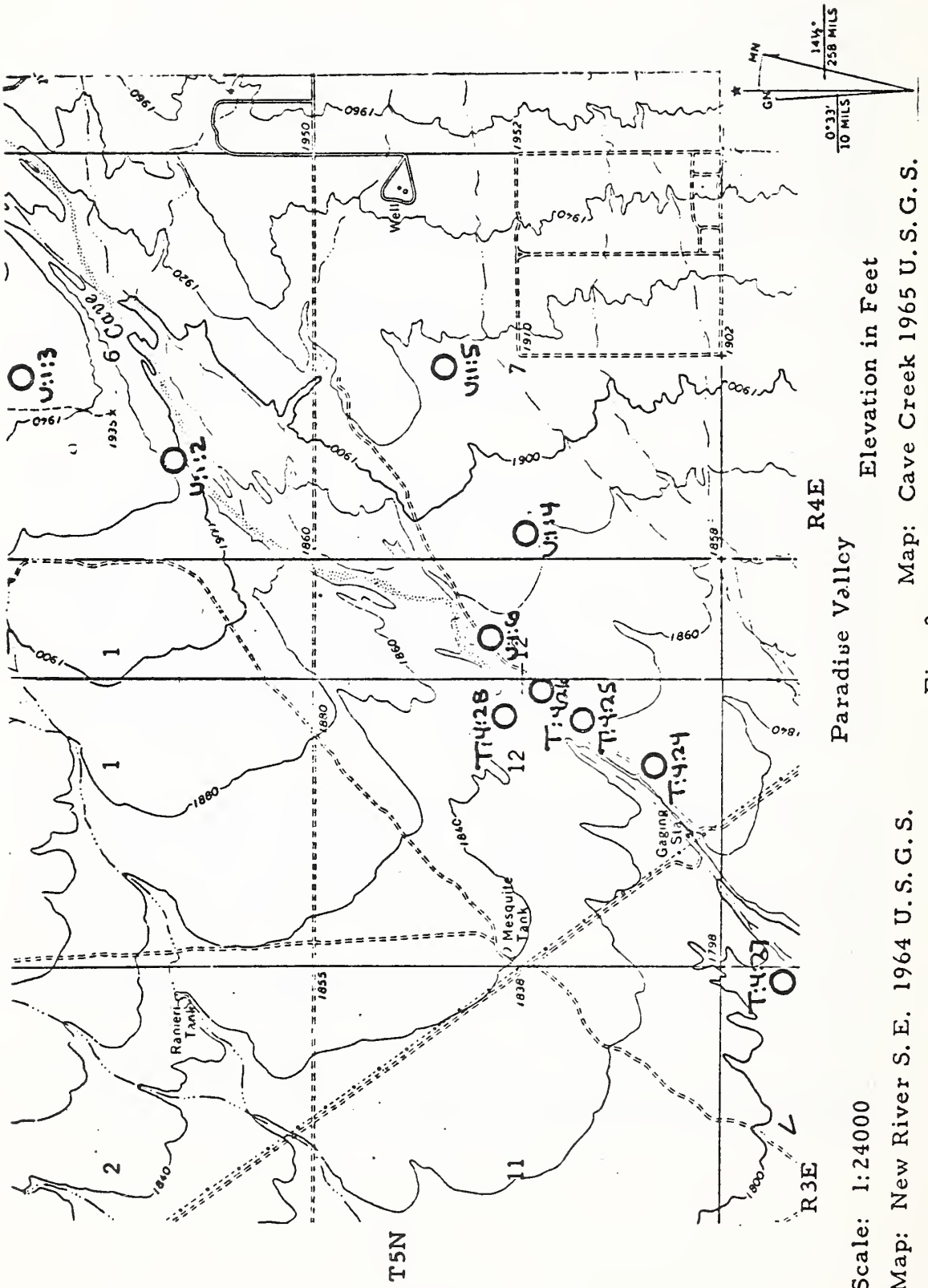
In addition, there was certainly more land capable of being cultivated than would be needed to support the population housed in the adjacent field houses, even if they could be considered to be occupied on a permanent basis.

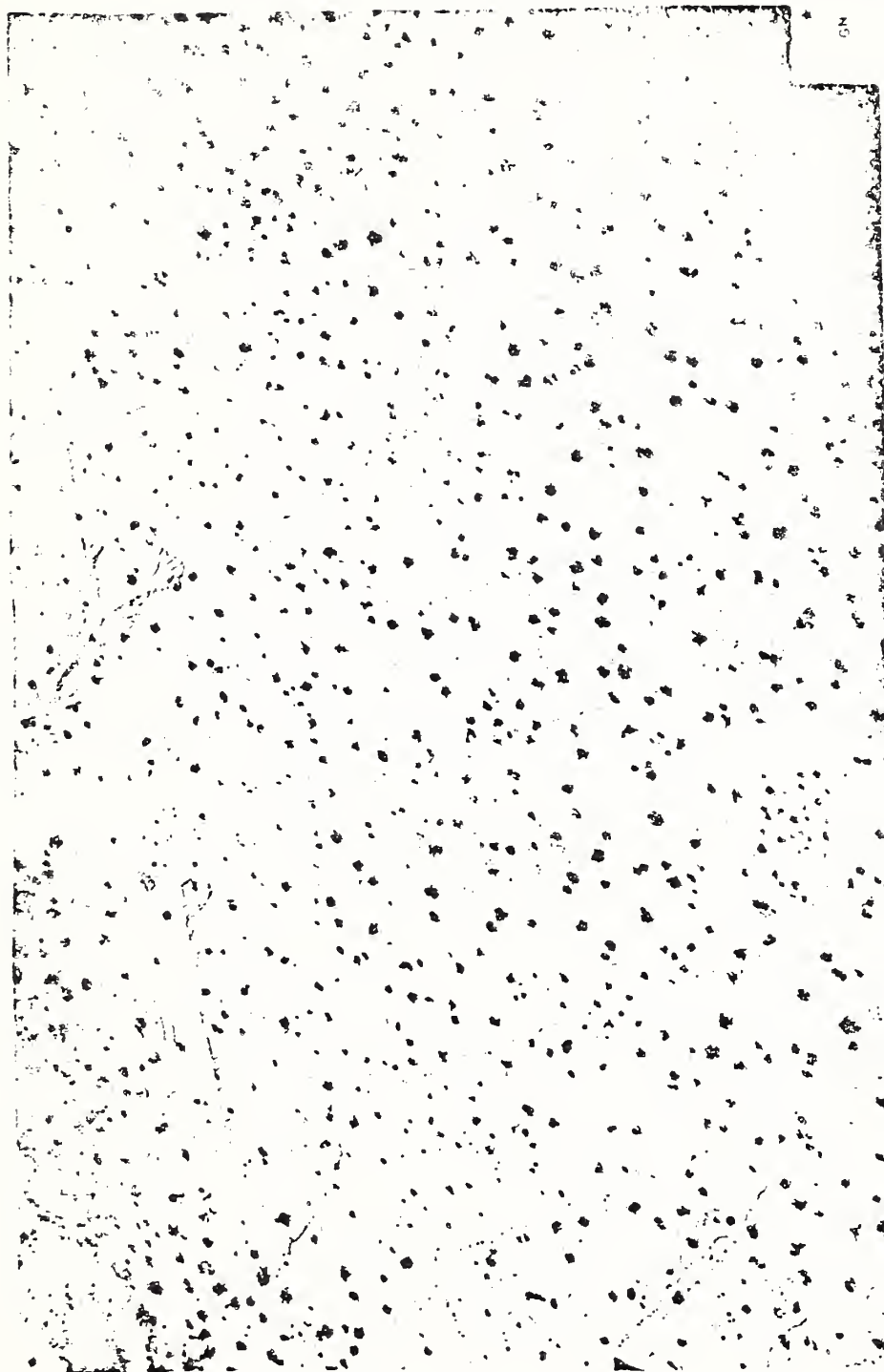
The pottery observed was consistent with that found at the previous site group, and those few painted sherds that turned up were from approximately the same Hohokam Classic time period. The pottery here was probably less biased by souvenir gathering than in the previous case, since these sites cannot be reached by ordinary car and the need for the use of four-wheel drive vehicles has reduced the extent of pot-hunting.

An unusual feature of the irrigated farmland observed here is the use of field dividers. These can be seen on the aerial photographs. Although one purpose that might be assigned to these rows of stones would be to separate ownership of one growing area from another, it seems more probable that these rows of stones were for water control purposes.

Entrance canals leading into distribution channels can be seen running behind the rows of stone dividers located at right angles to the direction of the stream flow.

This group of sites seems to display pottery and architecture in keeping with the Cave Creek Retention Dam sites, with Classic Hohokam as the probable time period of occupation.



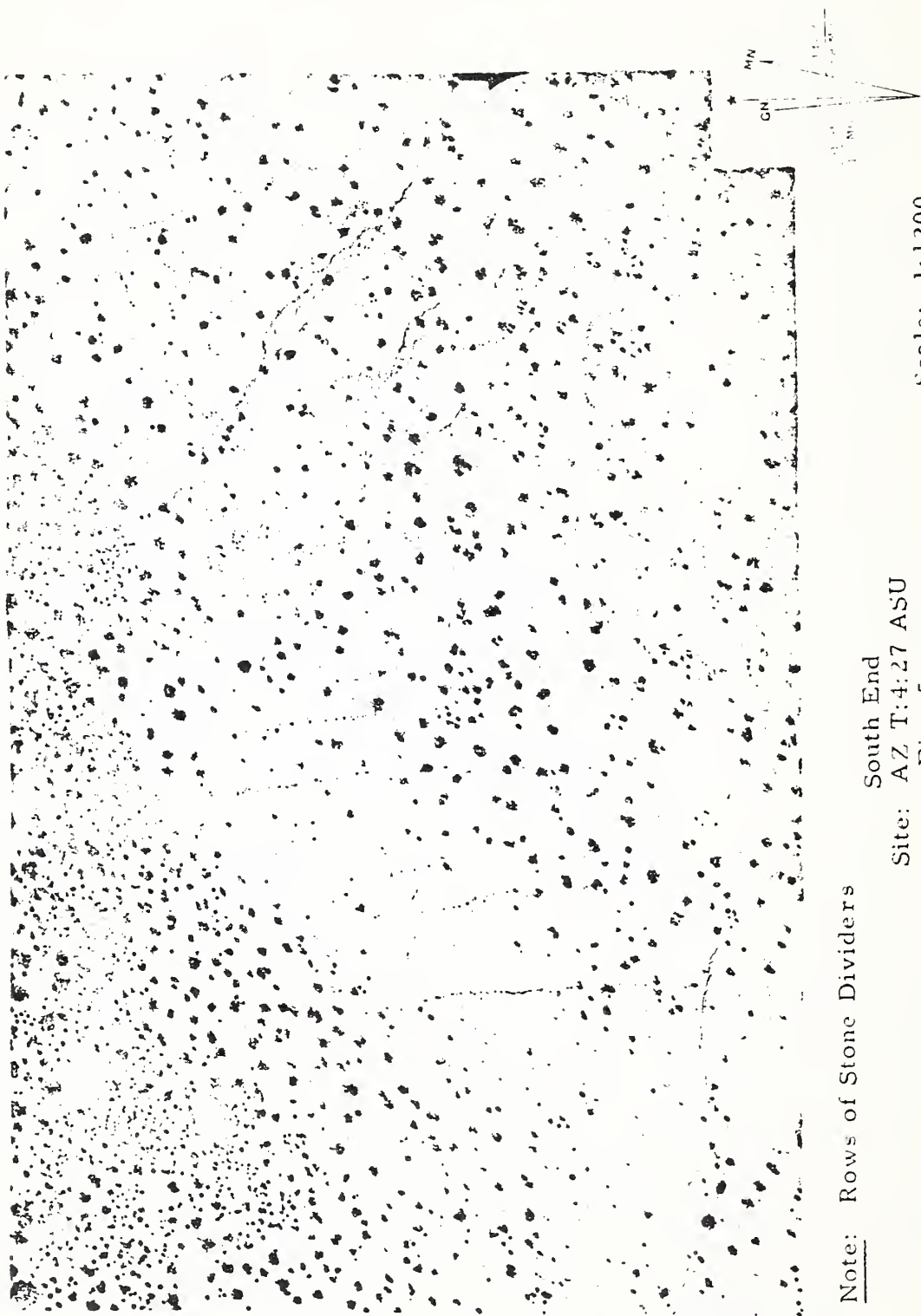


Note: Rows of Stone Dividers

Center Section  
 Site: AZ T:4:27 ASU  
 Fig. 4

Scale 1:1200

Kenney Aerial Mapping



Note: Rows of Stone Dividers

South End

Site: AZ T:4:27 ASU

Fig. 5

Scale: 1:1200

Kenney Aerial Mapping

TABLE II

## Site Summary

Paradise Valley

| Site No.        | Kind of Site                          | Size and Related Position  | Ceramics/Lithics   | Other  |
|-----------------|---------------------------------------|--|--|--|
| AZ T:4:24 (ASU) | Field houses                          | Three scattered rooms overlooking T:4:28 on east bank of creek.  | Wingfield Plain--one Gila shoulder--one Gila Red-smudged. Stone picks/chisels.                               | Rooms outlined by river cobbles--no depth to site.                                     |
| AZ T:4:25 (ASU) | Field houses.                         | Six scattered rooms overlooking T:4:28 on east bank of creek.  | Wingfield Plain - one Gila shoulder.   | Rooms scattered--range from three by three to five by five meters.                     |
| AZ T:4:26 (ASU) | Field houses                          | Two small rooms overlooking T:4:28 on east bank of creek   | Wingfield Plain--one sherd with Gila shoulder.   | Room outlined by river cobbles.  |
| AZ T:4:27 (ASU) | Irrigated agriculture                 | Approx. 20 ha. of stone boundary lined fields on west bank of creek.   | Wingfield Plain. Salt/Gila Red--some smudged. 1 Gila shoulder. Stone picks/chisels.                          | One small field house associated.  |
| AZ T:4:28 (ASU) | Irrigated agriculture                 | Approx. 4 ha. of stone boundary lined fields on west bank north of T:4:27.   | Wingfield Plain. Salt/Gila Red--some plain some smudged. Four Gila shoulders. 30 sherds Sacaton Red-on-buff. | Irrigation ditch at north end still visible.   |
| AZ U:1:2 (ASU)  | Habitation, dry farming, field houses | Approx. 50 house forms--some inside compound. Garden plots & field houses overlooking U:1:3 and on west bank of creek. | Wingfield Plain, 3 Gila shoulders. 12 Red-on-buff Sacaton phase. Hammer stones pick/chisels and debitage.    | Compound approx. 35 meters by 35 meters with 3 rooms inside outlined by river cobbles. |
| AZ U:1:3 (ASU)  | Irrigated agriculture                 | Approx. 12 ha. taking water from diversion canal stretching approx. 1.6 km. upstream on west bank of creek.            | Wingfield Plain  | Flowed in historic times. Not much left.   |

TABLE II

(continued)

## Site Summary

Paradise Valley

| Site No.        | Kind of Site             | Size and Related Position   | Ceramics/Lithics           | Other  |
|-----------------|--------------------------|---|----------------------------|--|
| AZ U:1:4 (ASU)  | Field houses             | 3 scattered rooms. East bank overlooking T:4:28.                      | Wingfield Plain - Salt Red | Rooms outlined by river cobbles.                                       |
| AZ U:1:5 (ASU)  | Agricultural-dry farming | Terraced gardens-approx. .4 ha. East side of creek adjacent to U:1:k. | Wingfield Plain            | On Alluvial bench collecting runoff water from surrounding high spots. |
| AZ U:1:6 (ASU)  | Field house              | 1 small room. East bank of creek overlooking T:1:28 to west.          | Wingfield Plain            | Room outlined by river cobbles.  |
| AZ U:1:22 (ASU) | Bed rock metates         | Gathering site 2.5 km. to east of Cave Creek                          | Wingfield Plain            | Sheltered food processing site overlooking desert.                     |

## Cave Creek

This section of the survey does not display any vestiges of irrigated agriculture. However, the alluvial flats along the creek and its adjoining benches are ideal for cattle grazing and the combination of ranching historic mining operations are probably responsible for the destruction of any signs of agricultural activity I feel sure once existed.

The two large habitation sites are combination compound and Pueblo, with some cut stone work as well as river bobble walls. Surface vestiges of firepits and plazas can be seen, despite some pot-hunting. Pot-hunting in places reveals that the site has some depth as walls can be seen going at least a meter below the present ground surface. The stone work in the walls does not seem to represent a change in construction techniques from the sites lower down the creek but simply the occurrence of readily available stone. This sector of the survey is in relatively mountainous rocky country, as contrasted to the two lower desert groups.

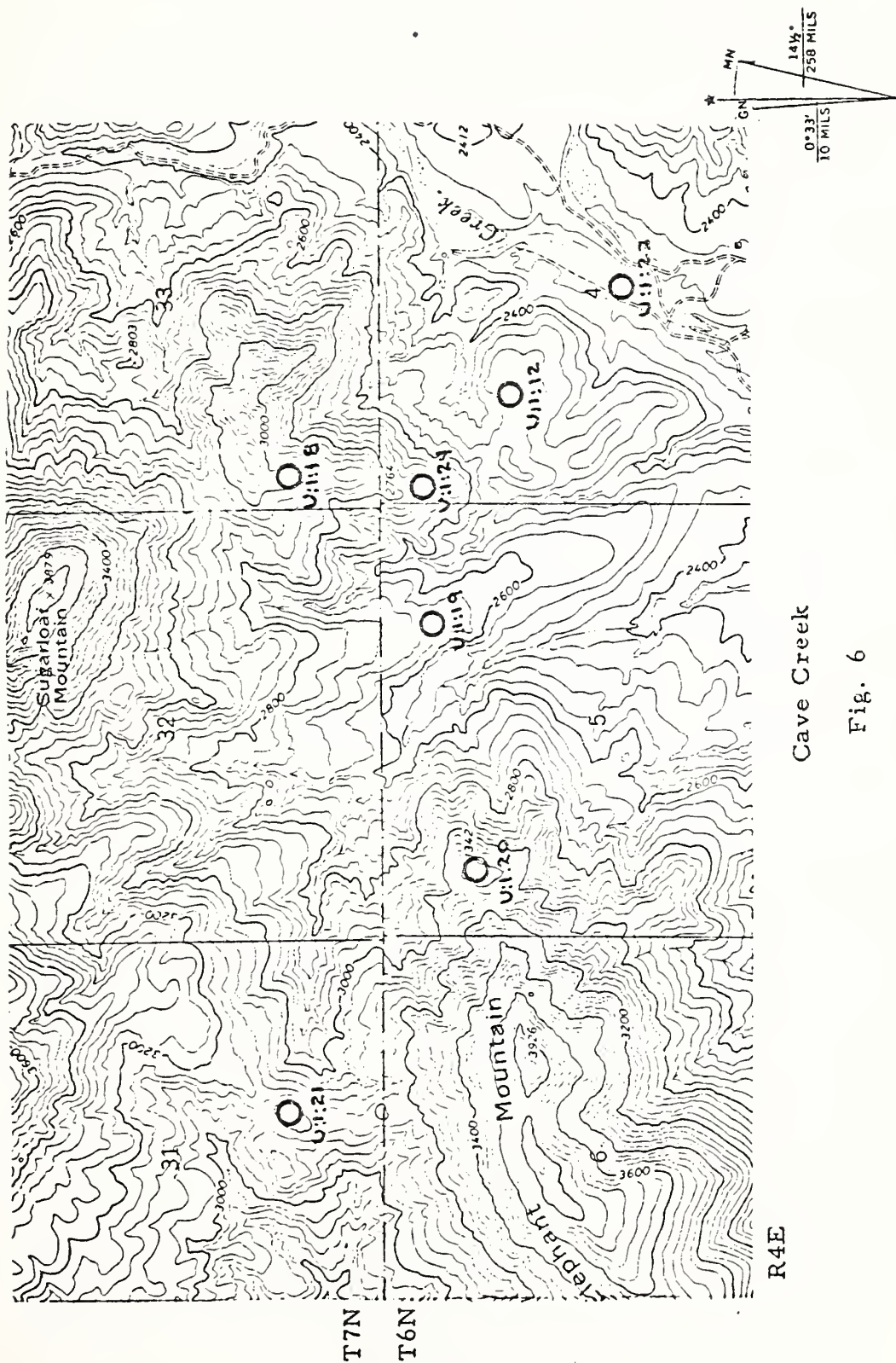
Each of the two major habitation sites is overlooked by a "fort" that commands a view of the surrounding terrain. It could be inferred that each village site had its own lookout post. However, a study of the setting reveals that either one of these "forts" could have served both communities as lookouts. Since each village was visible from the other at ground level, a reasonable conclusion results that each village had its own and that other uses than strictly lookout may have been present.

The villages are located on the benches overlooking the creek bed but are not constructed or located with defense as such primary consideration. An estimate of the numbers of rooms involved in the houses certainly reflects that there are more population residing here than could be supported by the arable land present.

The pottery throughout this sector is like that found in the two previous groups of sites. Wingfield Plain and Gila Red are predominant. It is interesting to note that not one piece of painted pottery could be found in this group. Lithics are consistent with the stone tools and hammerstones found at the other habitation sites.

An outstanding feature of this group is the fort at site AZ. U:1:20 (ASU). This fort has what appear to be peep holes in the walls overlooking the only access from the west. It is obvious that these peep holes could not have served as arrow ports due to their location and size. The fort itself is a full day's hike, round trip, from the creek bed sites. While it is in a defensive position from an assault point of view, a siege would certainly bring defeat in a short time.

The probable date of occupation for these sites remains the same as for the others found in the survey. It is somewhere around the A. D. 1200 period of the Hohokam Classic phase, however, the usual attributes assigned to Hohokam are not observed.



Cave Creek

Fig. 6

Scale: 1:24000      Elevation in feet      Map: New River Mesa 1964 U. S. G. S.

TABLE III

## Site Summary

Cave Creek

| Site No.        | Kind of Site               | Size and Relative Position  | Ceramics/Lithics  | Other   |
|-----------------|----------------------------|---|---|---|
| AZ U:1:12 (ASU) | Habitation with compound   | Approx. 30 rooms--some with contiguous walls. West bank of creek.   | Wingfield Plain. Three Gila should-ers. Picks/chisels and hammer stones for lithics. Gila Redwares. | Two compounds evident. Combination compound and pueblo type boulder walls. Some contiguous rooms. |
| AZ U:1:18 (ASU) | Fort                       | To north of and overlooking U:1:12.                                 | None  |   |
| AZ U:1:19 (ASU) | Habitation with compound   | Approx. 20 rooms with compound. Next bench to south of U:1:12.      | Wingfield Plain   | Not as permanent construction as U:1:12 (ASU).  |
| AZ U:1:20 (ASU) | Fort                       | On spur of Elephant Mt. overlooking U:1:19.                         | None  | Has peep holes in walls.  |
| AZ U:1:21 (ASU) | Fort                       | To west of Cave Creek sites overlooking Paradise Valley.            | None  | .   |
| AZ U:1:23 (ASU) | Petroglyphs                | On rocks at creek bed level on east bank below U:1:12.              | None  | Isolated from habitation sites on opposite bank of creek.   |
| AZ U:1:24 (ASU) | Habitation and Petroglyphs | Six rooms approx. four by four meters on saddle overlooking U:1:12. | Wingfield Plain   | Seems to serve U:1:18 Petroglyph adjacent.  |

## Skull - New River Mesa

The sites in this group are located in extremely broken terrain. The benches rise above the creek bed at the 725 m. elevation to a maximum of 1270 m. within a distance of a little over 1.5 km. The architecture here is the Pueblo type with contiguous rooms and walls encompassing the perimeters. The two sites located on the creek bluffs are surrounded with thick walls on all but the sides overlooking steep drop-offs. The sites on the higher benches are not as heavily walled but it should be pointed out that access to these could only be achieved subsequent to passing by or through the sites overlooking the creek. Each village seems to have within its confines one room which is much bigger than the rest. The central location of these larger rooms seems to indicate a possible ceremonial connotation.

Bed rock metates are located along the creek bed as well as on top of the mesa itself. The use of such metates seems quite logical when it is considered that the transportation of the gathered/collected crops to the village involves very difficult climbing. Once again, the number of villages and rooms indicates a population far in excess of the arable land present. The mesa top has quite a few acres that could be used for dry farmed crops, but the growing season would be especially short at this 1270 m. elevation, since the mesa top is windswept throughout the year. Food preparation also took place in the villages as evidence by large quantities of broken metates scattered around the ruins.

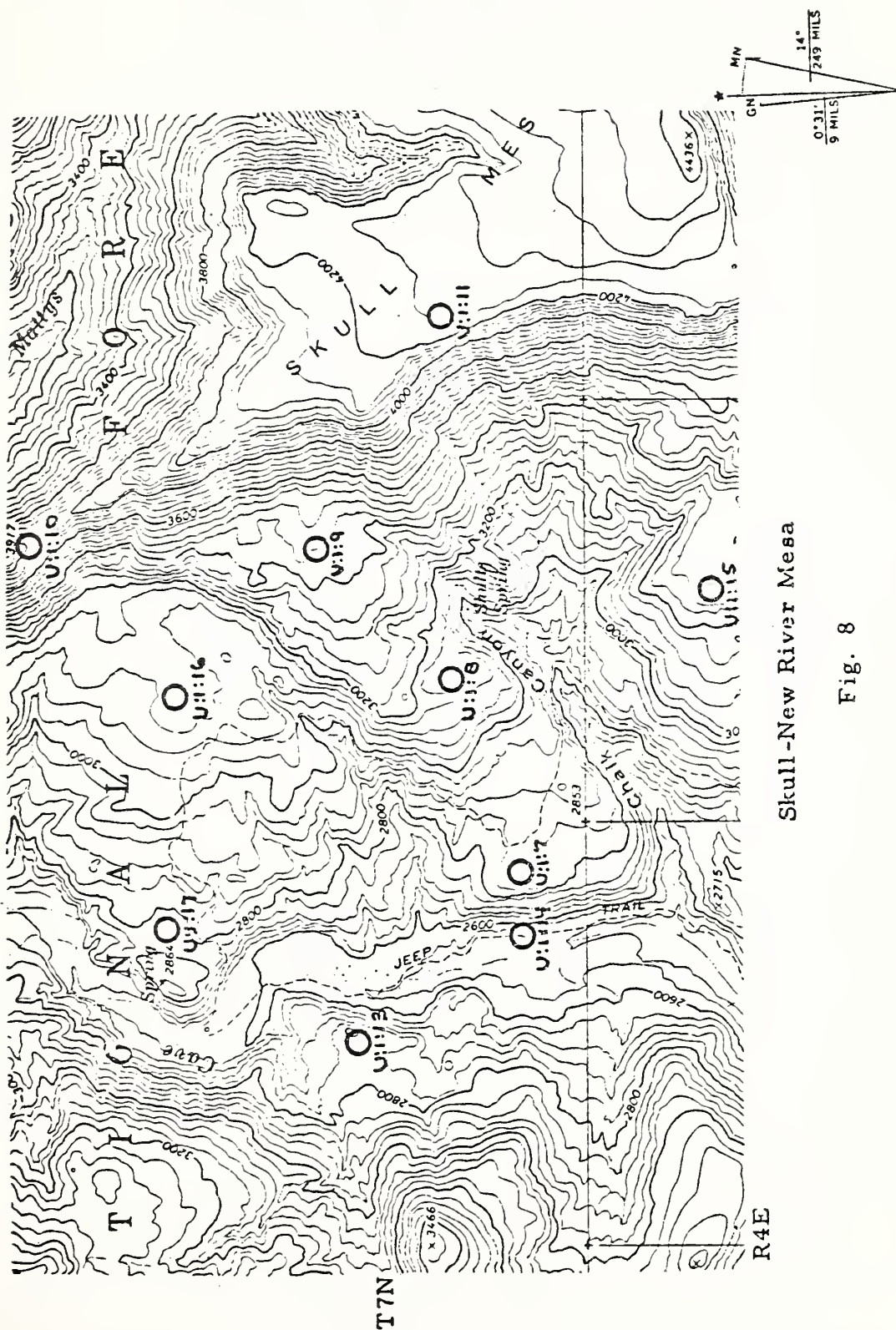
All the habitation sites display uniform pottery assemblages. Wingfield Plain and Gila Red predominate. Some smudging and polishing in the redware is evident. Not a single sherd of painted pottery could be found. The presence of a spindle whorl at AZ U:1:13, as well as pieces of shell, indicate Hohokam trade connections. Otherwise, the architecture, pottery and village layouts are remarkably uniform. Once again, the indications point to occupation during the Hohokam Classic period circa A. D. 1200.

The fort located at the extreme northwest corner of Skull Mesa is situated in an extremely prominent defensive position. Sheer drops of approximately 300 meters on three sides limit access to the fourth across a narrow saddle only a few meters wide. Since broken metates are in evidence here, it can be assumed that the rooms contained some permanent inhabitants. While it could be defended for a time, lack of water would in a short time ensure its downfall. However, from a lookout standpoint, all movements up and down the creek for several kilometers in each direction would be under constant observation.

While the large population housed in this area had insufficient crop land available to them, the importance of these sites should be considered in the light of the water supply flowing here in the creek occupation during the Classic Hohokam time period.

year around. Springs pour out of the sides of the cliffs at creek bed level, ensuring a constant water supply.

Other than a consistency of pottery, i.e., Wingfield Plain plus Salt and Gila redware, intergroup patterns between the sites in this complex and those situated at lower creek levels are hard to discern. A case could be made for the type and kind of lithic tool such as picks and chisels found at all locations which were all smooth surfaced with the exception of hammerstones. However, similar water smoothed shapes can be found today along the entire creek bed. It is only possible to identify the lithics as such due to their being out of context with the creek and in every case one point or edge was found to be blunted through use.



Skull-New River Mesa

Fig. 8

Scale: 1:24000 Elevation in Feet Map: New River Mesa 1964 U.S.G.S.

TABLE IV

## Site Summary

Skull - New River Mesa

| Site No.        | Kind of Site                         | Size and Relative Position   | Ceramics/Lithics   | Other  |
|-----------------|--------------------------------------|--|--|--|
| AZ U:1:7 (ASU)  | Multiroom habitation.<br>Petroglyphs | Approximately 30 rooms<br>pueblo type on bluff<br>overlooking creek from<br>each bank. | Wingfield Plain. Gila Should-<br>ers, Gila Red - some smudges.   | Contiguous rooms--one<br>larger than rest.<br>Defensive site.                            |
| AZ U:1:8 (ASU)  | Multiroom habitation.                | Approximately 60 rooms<br>pueblo type on next<br>bench up from U:1:7.                  | Wingfield Plain, Gila should-<br>ers, Gila Red--some smudges.<br>Hammerstones pick/chisels plus<br>debitage. | Petroglyphs inside site<br>walls. Compound wall--<br>one room larger than<br>rest.       |
| AZ U:1:9 (ASU)  | Petroglyphs                          | Next bench up from U:1:8<br>rock out-cropping.   | Wingfield Plain - scattered.   | Petroglyphs in pro-<br>fusion  |
| AZ U:1:10 (ASU) | Fort                                 | Isolated peak on northwest<br>corner of Skull Mesa--<br>overlooks valley below.        | Wingfield Plain - trough<br>metates.   | Inaccessible from valley<br>below  |
| AZ U:1:11 (ASU) | Petroglyph and dry<br>farming        | Near cliff edge west side<br>Skull Mesa.   | Wingfield Plain/Gila Red.  | Seven grinding stations.<br>Collecting/gathering<br>site. Petroglyphs<br>associated.     |
| AZ U:1:13 (ASU) | Multiroom habitation<br>Petroglyphs  | Approximately 40 rooms<br>fortified over-looking<br>creek to east--opposite<br>U:1:7.  | Wingfield Plain. Gila Red--<br>some smudged. Gila Shoulders.   | Spindle whorl and pieces<br>of shell. Defensive<br>pueblo site. Fire pit<br>in one room. |
| AZ U:1:14 (ASU) | Petroglyph & bed<br>rock metates     | East bank of creek at<br>stream level under<br>AZ U:1:7.                               | None   | Gathering site at base<br>of cliff.  |

TABLE IV  
(continued)  
Site Summary

| Site No.        | Kind of Site         | Skull - New River Mesa   |   |   | Other |
|-----------------|----------------------|--|---|---|-------|
|                 |                      | Size and Relative Position                                     | Ceramics/Lithics  |   |       |
| AZ U:1:15 (ASU) | Multiroom habitation | Approx. 20 rooms pueblo type. Overlooks U:1:7,8 to west.       | Wingfield Plain. Gila Red-some smudged. Gila shouldered.          | Trough metates. Not as much depth to site as defensive sites below. |       |
| AZ U:1:16 (ASU) | Multiroom habitation | Approx. 25 rooms pueblo type. Overlooks U:1:7 to west.         | Wingfield Plain. Gila Red-some smudged. Gila shouldered, chisels. | Broken metates. Fitted stone walls. One room larger than rest.      |       |
| AZ U:1:17 (ASU) | Multiroom habitation | Approx. 10 rooms on bluff overlooking creek to north of U:1:7. | Wingfield Plain. Gila Red-some smudges.                           | Overlooks approximately five acres farmland.                        |       |

### CHAPTER III

#### Archaeological Background

This chapter outlines the published knowledge applicable to those remains in the Cave Creek drainage located by the survey. A review of the existing literature extends this synthesis to the drainages existing on either side of Cave Creek. The drainage to the east is the Verde River with its permanent running water, in contrast to Cave Creek with its seasonal flows. The adjacent drainage to the west are the Agua Fria and New River and have only intermittent flows. Each of these drainages exhibit many similar cultural traits during the time period represented by the surface manifestations discovered by the survey in Cave Creek.

#### Archaeological Background of Cave Creek Drainage

At the Cave Creek flood control dam portion of the survey, sites AZ T:8:30 and 31 (ASU) have been described and evaluated by Ditter, Fish, and Simonis (1969:21-23). AZ T:8:30 (ASU) has not been included in the present survey since it has been completely destroyed by gravel mining operations prior to the time that the current observations were made. AZ T:8:31 (ASU) was evaluated by those authors as being in the A. D. 1200 time period on the basis of the architecture and the irrigation systems present, plus a sherd of Casa Grande Red-on-buff. All the rest of the pottery of this site was Wingfield Plain. AZ T:8:31 (ASU) at the present time is very close to destruction due to pot-hunters and vehicular traffic.

Sites AZ T:8:32 to 38 (ASU) were discovered and tabulated during the course of a survey of the proposed Cave Buttes Dam area in the spring of 1970, conducted by the Department of Anthropology at Arizona State University. The writer and another graduate student, Sue La Follette, conducted the basic survey. This locale produced a variety of sites ranging from house forms, garden plots, petroglyphs, a fortress, and irrigation systems, and was considered to represent Classic Hohokam period manifestations due principally to the presence of few sherds of Hohokam Classic Period pottery. Care was taken at the time by the surveyors to insure that the manifestations present were not labeled as Hohokam per se, but only identified as being in the Classic time period. However, one site AZ T:8:37 (ASU) did display a relatively high percentage of Hohokam Sacaton Red-on-buff pottery sherds sufficient to warrant its inclusion in a designation of Hohokam per se. L. Douglas Smith, a graduate student at Arizona State University, has since excavated in the dam area, but his results are not yet at the publishable stage. By personal communication he does advise that what he has seen to date also indicates

On the east bank of Cave Creek, opposite site AZ T:4:28 (ASU) Ayres (1967:106-111) reports the results of his excavations at site U:1:11 which consisted of a series of field houses and garden plots due for destruction as the result of a sanitary land fill operation. The presence of Wingfield Plain pottery and a single spindle whorl led him to place the occupation in the Classic Hohokam period. Ayres (personal communication) advises that the ruins located at site AS U:1:2 (ASU) were originally classed as Salado by Dr. Wasley on the basis of the compound present.

The only published reference involving the Skull-New River Mesa portions of the survey are cited by Schroeder (1940:62-64). His boulder site number 83 and his fort site number 84 are found here. An attempt was made to locate his two sites accurately by referring to his original field notes lodged at the Pueblo Grande files. However, the map coordinates shown on his field notes bore no relationship to his descriptions and apparently had been added at a later date. His field sketches did show Cave Creek and sufficient topographical information to spot their locale accurately. His site number 83 corresponds to AZ U:1:12 (ASU) while his site number 84 coincides with AZ U:1:20 (ASU). On the basis of pottery finds, Schroeder places his site 83 in the Civano and Sacaton phases and his site 84 in the Civano and Santa Cruz phases. He neglects to indicate whether his diagnosis was based on the Salt/Gila Red and Wingfield pottery which can be seen on the ground at the present time or whether he actually found some painted pottery of Hohokam origin. Unfortunately, his sherd collections cannot be located for a check on the presence of Winfield Plain and/or other pottery types. It is possible that the Wingfield types had not been fully identified at the time of his survey. However, Schroeder does mention (1954:103) correspondence from a second party reporting Wingfield Plain pottery from the Cave Creek area but with no indication as to exact locale.

The only other reference concerning Cave Creek to be found in the literature is Dove (1970:10) who found Wingfield Plain pottery near the town of Cave Creek but gives no precise location.

Turney (1929:144) states that on Cave Creek and Camp Creek, and scattered about the countryside some fifty km. north of Phoenix, are many stone built ruins of the walled village type, usually on commanding points with the walls built flush with the edge of the bluff containing anywhere from fifty to one hundred rooms, all associated with a coarse gray dull pottery. Chenhall (1967:53) contends that there is a definite sequence of sites extending from the Verde River and its tributaries across and through Bloody Basin to Cave Creek, New River, and Agua Fria River. He reports sites located on defensible hills and/or surrounded by walls consisting of

Pueblo-type buildings constructed of river boulders. He also confirms that no indigenous painted pottery is present and that Salt and Gila Redwares predominate.

It is obvious that the known information about the archaeological remains along the creek is extremely meager and the culture-time interpretations placed upon them are based on less than adequate data. In summary, it can be said that the authors who have investigated Cave Creek take the view that a time period of Classic Hohokam is in order but whether the remains are, in fact, Hohokam, is either skirted or ignored.

#### Archaeological Background of Adjacent Drainages

The adjacent main drainages on either side of Cave Creek are the Verde River flowing permanently to the east and the Agua Fria and New River drainages just to the west. Both of these rivers on the west are dry most of the year with running water in flooding circumstances during the summer rainy season and then only for a few days at a time.

Investigating archaeological work done in the Agua Fria-New River sector first, it is disconcerting to find that definitive surveying and excavation results are almost as meager as indicated for Cave Creek. Fish (1971:13-14) investigated a Colonial Period Hohokam site south of Lake Pleasant on the east bank of the Agua Fria. Although he reports that Wingfield Plain dominates the ceramics found, the presence of a high percentage of Hohokam Red-on-Buff decorated sherds plus the occurrence of pit houses seems to remove this site for direct comparison with those found in the Cave Creek area.

The same site has been more fully covered by Weed (1972:57-94) who confirms a Colonial Hohokam designation for the site with special comment on the presence of Wingfield Plain pottery as the most dominate pottery. It is interesting to note that she comments on the presence of canal systems, farming plots, terraces and waffle gardens to the south of her Beardsley Canal site (1972:91). Her inference is that these agricultural establishments were associated with the Colonial Hohokam remains under investigation.

Dove (1970:29) identifies stone work, architecture and hilltop structures associated with the Calderwood site on the lower Agua Fria as having characteristics of considerable variance with the neighboring Hohokam. Again, Wingfield pottery comprised over 95 percent of the pottery collected at the site.

Weed and Ward (1970:10) are able to assign their Henderson site located on the upper Agua Fria to the Colonial Hohokam period; with Wingfield Plain again as the dominant pottery type. However, the pit house architecture and the painted pottery sherds leave no doubt that Hohokam is the proper designation. The artifactual remains found in the course of this survey are not compatible with this Agua Fria site.

Turney (1929:156) reports a canal on New River some seventy one km. northwest of Phoenix with a canal entrance about twelve meters above the present river bed level and associated with approximately eighty hectares of terraced land irrigated by the collection of hillside run-off water. It would appear that water run-off patterns must have changed since these canal irrigation systems were used. The resulting deep erosion reducing the river bed levels to the extent that stream water can no longer enter the canal entrance.

Once the upper reaches of the Agua Fria River are entered and the Bradshaw Mountain area is surveyed, the Hohokam influence seen at the lower levels disappears. Over forty site locations in the Bradshaw Mountains reveal no decorated pottery of any kind (Gumerman and Johnson 1971:94). Their sites are of a Pueblo-like character located along the edges of plateaus and on isolated buttes protected by defensive like walls overlooking scattered farming units. All pottery is either redware or other varieties of plain ware. Schroeder (1954:103) takes the view that one of the dominant characteristics of this region north of the Salt River would be the plain ware pottery and he particularly ascribes the origin of the Wingfield Plain variety to the upper Agua Fria River drainage.

Gladwin (1930:197) is also able to point out that between Congress and Phoenix there are a large number of ruins ranging in size up to fifty rooms with Gila redware being the only pottery found. He later extends this statement to include survey results in the east quarter of the Bradshaw Mtns. as well as the lower Verde Valley. Fewkes (1912:207) also finds similar ruins in the upper Agua Fria drainage and was able to make direct comparisons with those found by Mindeleff in the upper Verde Valley. His report of a settlement and nearby fort on the upper Agua Fria River (1912:215) fits perfectly the site descriptions of the Skull-New River Mesa portion of the survey under discussion.

Since the Verde Valley with its constantly flowing river lies a few kilometers to the east of Cave Creek, it seems logical to expect to find there cultural manifestations of a similar nature. The headwaters of Cave Creek rise among the bluffs overlooking the Verde and interaction between the peoples inhabiting each would be inevitable. Survey work in the Verde Valley was started by Mindeleff (1896) and Fewkes (1898 and 1912), both of whom were able to describe sites

and agricultural systems that no longer exist today due to the ravages of time and human destruction. Their observations describe stone walled villages on bottom lands or in defensive positions as well as boulder marked sites. Gladwin's survey (1930) of the Verde Valley provides parallel descriptions. Mindeleff (1896:194) finds that the boulder sites are always found overlooking tillable land and seemed to be of a temporary nature.

Confusion exists between the descriptions used by these three archaeologists and care must be taken to understand their meaning completely. Although fortresses as such are mentioned by all three (Gladwin 1930, Fewkes 1912:207, Mindeleff 1896:237-243) Gladwin likes to use the term "boulder marked" in place of Fewkes' "fort" and Mindeleff's "defensive."

Shutler (1951:1-9) describes two sites in the upper Verde Valley of which one is a three room masonry pueblo with thick massive walls located in a defensive position and the other an eighteen roomed pueblo located at the base of a sandstone cliff. It is interesting to note that both of these sites produced pottery with Alameda Brownwares predominating. Shutler dates these sites as A. D. 1125-1160 for the first and early thirteenth century for the second. In both cases he uses Sinagua to describe their cultural affiliations.

Breternitz (1960) is able to identify, through excavation at a series of sites in the Verde Valley, a long sequence of occupation stretching back some 2000 years. It is his Honanki and Tuzigoot phase sites that are comparable in description to the sites located along the Cave Creek drainage. He dates these two phases during the period from A. D. 1100 to 1425, and uses Colton as the authority to assign them to the cultural entity known as Southern Sinagua.

At the King's ruin excavated by Spicer and Caywood (1936) two phases of occupation were found. The first contained below ground floor dwellings and was assigned by the authors to a pre-A. D. 1026 date. However, after that date and until A. D. 1200 they are able to identify habitation sites consisting of small pueblos with contiguous rooms of adobe and river boulder masonry, (1936:82). Although the sites under investigation were located along the Chino Creek, a tributary of the Upper Verde, their descriptions certainly parallel the type of ruins found in the Cave Creek drainage. This same reference details excavations at a site known as the Fitzmaurice ruin located in the upper Agua Fria drainage (1936:88) near Prescott. In this case, the ruin is a mesa tip pueblo of more than thirty rooms situated on the top of a steep sided hill. Again, the occupation period was assigned to the A. D. 1000 to 1300 time period.

Other site studies in the Verde region that seem to offer contemporaneity with the Cave Creek remains are reported by Schroeder (1954) with his four pueblo sites near Mayer, Arizona, each associated with Wingfield Plain pottery. However, at that time he contends (1954:106) that he is unable to assign these sites to any of the neighboring cultures.

## CHAPTER IV

### Site Type Archaeological Research

The previous chapter reviews the archaeological background of the area surveyed as well as the adjacent drainages on either side. Such a review, by necessity, was concerned with areal descriptions. This chapter takes some of the more distinctive manifestations found and for discussion purposes lifts them out of their areal context and individually reviews their meaning and presence in the southwest.

Some of the kinds of sites observed do not lend themselves to any kind of analysis other than induction of a speculative nature since definitive interpretations of their meaning have had little success.

#### Bed Rock Metates

Bed rock metates seem to have a numerous occurrence throughout the area under discussion. However, it is difficult to attach any specific cultural significance to their presence. The entire area has suitable rock in large boulder form in profusion and it seems obvious that the grinders would sit down and grind their collecting efforts wherever convenient. Why move heavy metates around the countryside when there was no need to? The peoples were making the best possible use of the available working materials and their presence or absence should have no other cultural implications than this.

#### Petroglyphs

Petroglyphs are another case in point. Their location, at least in the Cave Creek drainage follows no discernable pattern; nor do the figures displayed lend themselves to any reasonable conclusions as to their meaning. Research on this subject yields only the fact that very little is known about their origin and purpose. No practical means have been found to date petroglyphs except through assumed association with nearby remains.

#### Agriculture

In connection with the water control and irrigation systems identified in the survey, Woodbury's definitions (1961:12-14) are used throughout. His use of the terms linear borders, grid borders, and boundary markers, plus field houses almost exactly match in description the agricultural control systems found along Cave Creek. It is interesting to note that while he is able to say that terraces and field borders do not occur prior to A. D. 1000 (1961:37), he is careful to point out that linear borders and grid borders are extremely difficult to date (1961:41) since the accompanying field

houses seldom contain any datable artifacts. Since Woodbury (1961:41) contends that the use of stone lined borders for agricultural plots are prevalent all over the southwest, it does not seem prudent to attach any particular cultural significance to their use. Schroeder takes the view (1960:23) that these forms of dry farming have their origins prior to A. D. 1125.

Canal irrigation could be found on only one Cave Creek site where the entrance and exit channels are still in existence. However, AZ T:4:27 (ASU) as well as the Cave Creek Retention Dam sites obviously had similar canal systems which are no longer visible. The current situation at AZ T:4:28 (ASU) is much like the report of Turney (1929:156-157) in which he describes canals at Camp Verde and New River whose entrance heads are as much as forty feet above present river water levels. This same discrepancy between present river bed levels and elevations of prehistoric entrance and exit channels seems to apply over a wide area indicating channel cutting on a large scale over the years. Under today's climatic conditions of rainfall, there is no practical way possible to make use of the river water for agricultural irrigation purposes on the acreage under discussion.

However, Castetter and Bell (1942:160) point out that present day Pimas have a practice of building a dam across creeks during dry weather, which is a relatively simple task. Then when water does flow, the dam would build up the water level so it would enter the entrance channels even though they might be considerably higher than the river bed itself. Although this reference has some merit, its application to the channels along Cave Creek do not seem practical as they are much too high for this practice to succeed.

Concern can be expressed at the amount of water available for irrigation by canal, in light of the infrequent rains of short duration during the summer growing season. Castetter and Bell (1942:170) provide for a substantial irrigation after the first heavy rain with planting taking place about a week thereafter. Then only one or two further irrigations are necessary for the crop to ripen and become harvestable. In other words, a couple of good heavy rains during the summer would do the job; even though the creek would be dry most of the time.

Canal irrigation systems can be found along all the major tributaries of the Salt and Gila Rivers (Woodbury 1961:553). Since such canal systems are an acknowledged Hohokam trait, there seems to be no doubt that their users were either Hohokam or under Hohokam influence. Other water control methods found throughout the southwest include rock alignments for slowing spreading runoff as well as the use of dry laid masonry terraces across small steep streams (Woodbury 1961:554-555). He also reports stone field borders following the land

contours as being prevalent throughout the southwest. Since we have irrigation by canal and these other methods present in the Cave Creek drainage, it is appropriate to point to Hohokam association or contact but, again, the evidence does not infer an exclusive Hohokam designation.

Gumerman and Johnson (1971:94) summarize the agricultural activities found in the region between the Bradshaw Mountains-Agua Fria drainage and the Verde Valley as falling into three categories:

1. Cleared areas catching water in small plots
2. Irrigation with canals
3. Waffle gardens

The results of this current survey certainly agree with these descriptions. It is interesting to note that the survey shows that these traits actually intrude into the desert proper at the Cave Creek Retention Dam sites previously considered to be exclusively Hohokam territory. Gumerman and Johnson (1971:87) seem to feel that such an intrusion may represent a cultural boundary with its perimeter extending into Hohokam heartland.

Attempts have been made to translate the size and kinds of these agricultural systems into quantities of peoples each would support. Castetter and Bell (1942:7) have tried to translate the present day farming methods of the Papago as being representative of these desert peoples methods. However, this is not a correct assumption to make since the Papagos, as desert peoples, and the Pimas, as river peoples, have become intermingled over the centuries so that a desert distinction for their farming techniques today is not appropriate.

However, their statistics on land usage do seem appropriate where they contend (1942:56) that a family of five could not cope with more than five acres of planted fields in view of the primitive stone tools available. Considering this the maximum, they propose (1942:31) that a figure of one quarter of an acre to a maximum of ~~two~~ acres would be more realistic. Assuming a yield of twelve bushels of corn or equivalent other crops to the acre, somewhere between three to twenty-four bushels of yield for a family of five could be counted on for subsistence as a result of their personal labor. At the higher level, it would seem that the entire crop needs for a person could be provided for a year if the crop was properly stored and cared for, including rationing out over the year's time. Shortages would have to be supplemented by collecting and gathering as well as some hunting. Since mesquite, buck wheat, chenopodium, amaranth, saltbush, jojoba, palo verde, as well as sahuaro, cholla, and prickly

pear cactus are all native to the Cave Creek drainage, collecting and gathering should have been a relatively simple task.

Concern over the need for these agricultural communities to be located adjacent to their land can also be resolved through ethnographic analogy since Castetter and Bell find (1942:42) that present day Papagos have a practice of living near water supplies during the winter and traveling to the fields to live temporarily during the summer months after the summer rains begin. They also report (1942:126) that the Pima think nothing of traveling up to six to eight miles (10 to 13 km.) daily to tend the fields and only move to the fields for shelter during harvest time. The main consideration seems to be water for human consumption as the deciding factor in location of permanent living quarters.

### Pottery

Brownware pottery is certainly predominant in the area being discussed. It is important to ensure that Wingfield Plain is accorded its proper place in this brownware complex since it is also found throughout the area under discussion. Through his observations at the Silo Site, Chenhall (1967:34) found a mix of Classic Period redwares plus Wingfield Plain and came to the conclusion that a ceramic complex existed along the Agua Fria and/or lower Verde Rivers that may have its origin just prior to the Classic Period and lasted throughout its duration. He likes a definition of "red-ware-mountain-top-pueblo complex." He also refers to this complex simply as "redware" rather than identify it with Classic Hohokam as such (1967:53) and raises the question of trade between these unnamed people and the Hohokam with the decorated ware, becoming intrusive into the redware area. Chenhall (1967:34) is able to find sites along all the drainages from the Agua Fria to the Verde containing hilltop Pueblos showing Hohokam Classic Period redwares, but with none of the decorated pottery normally associated with Hohokam.

Reed (1950:123) also likes to think of these middle Verde-Flagstaff areas as being the locale of a polished red or brownware having no decorated pottery. However, he prefers to link the makers of this pottery to eighth and ninth century Mogollon antecedents (1950:136) who fall in his category of "Western Pueblo" complex. As far back as 1912, Fewkes finds (1912:218) that the attributes he saw in the Verde reflected the endeavors of "frontiersmen" of the Salt and Gila River peoples. Van Valkenburgh (1961:15) considers them to be an indigenous "paddle-and-anvil brownware people," subject to cultural influences from neighbors and places them in the same category as Ootam, Pioneer Hohokam, Verde Valley Hohokam, Patayan and Sinagua. Reed (1948:15) eliminates both Sinagua and Salado from his concept of "Western Pueblo" but in doing so he recognized

difficulty in this term and simply falls back on a culture-type he calls "southern brownware complex" implying overtones of Mogollon connections.

Since Wingfield Plain has been identified by Colton (1937:45) as a variety of Gila Plain but with a mica shist temper, it seems difficult to say just where its origins lie as such tempering material has a widespread distribution throughout this part of Arizona. Schroeder compounds this origin problem by then suggesting that such pottery is intrusive from the Agua Fria into the Verde Valley and the Flagstaff region (1954:103) (provided, of course, its movement can be traced from the Agua Fria area). Wingfield Plain has been found as far afield as the lower Gila River by Breternitz (1957:8) in a site that he identifies as a temporary campsite.

In the course of outlining the nature and extent of the pottery found in the general area of Cave Creek and neighboring drainages, mention has been made that the attributes being observed do not fit the normal Salado-Hohokam patterns. Dismissal of Salado from consideration is relatively easy, particularly if one accepts Pierson's practical definition of Salado (1952:67) as being limited to only those peoples who made the Salado Polychrome pottery. His contention that Salado is a mix between Mogollon and Anasazi may have some merit. However, no polychrome Salado pottery can be found in any reported accounts of ruins so far described.

Breternitz is another who has tried to resolve the problem. He proposes to lump Gila Plain as being a part of the Alameda Brownwares including Wingfield Plain and places this whole pottery complex within the framework of a common ceramic tradition (1960:27). He refrains from putting a formal name to these manifestations but suggests a basic "folk culture" overlain with ideas from other cultures. This is echoed by Olsen (1963:93) when he considers that the indigenous peoples between the Hohokam and the plateau cultures to the north need clarification. He defines the extent of these indigenous peoples as being along the natural access routes from the north to the south along the Verde and Agua Fria drainages inferring, of course, the inclusion of the drainages in between. However, he then (1963:95) amends this theory by concluding that a definite tie with Mogollon can be postulated.

Once the paddle and anvil pottery trait is established as a base, it then becomes difficult to accept arguments such as that proposed by Ferdon (1955:13) when he combines the brownware pottery into a cultural mix with contiguous rooms and extended burials to reflect a Pueblo origin. Since the Pueblo-Anasazi pottery is always a coil and scrape process, paddle-and-anvil pottery simply does not belong in the Pueblo considerations. However, Schroeder (1956:305) does not use the difference in pottery making techniques to refute Ferdon.

Instead, he uses the lack of kivas to distinguish the Sinagua from the Pueblo peoples.

Unfortunately, the issue becomes clouded when Colton (1946:307) accounts for variations in pottery firing techniques within the Sinagua itself by dividing the oxidizing atmosphere firers from those using reducing atmosphere ovens. He explains such variations away by proposing that the northern branch of Sinagua adopted the reducing method from the Anasazi peoples to the north and that his southern branch learned the oxidizing method from the Hohokam in the south. His inference being that these peoples were learners and adapters rather than inventors or innovators in their own right. Either a new definition of Classic Hohokam is needed that will accommodate the masonry structured redware makers or alternatively open up a present definition to adequately provide a cultural description to suit these variations from normal. At this point it seems prudent to leave the argument unresolved and simply state that a remarkable similarity exists in the pottery found in the drainages between the Agua Fria and Verde Rivers.

Since the pottery sherds evident in the Cave Creek drainage do not lend themselves to classification as Hohokam/Salado, another clay artifact may provide some helpful diagnostic information. In this case reference is made to the spindle whorl found at site AZ U:1:13 (ASU) and an analysis of its occurrence in the southwest may prove helpful.

Although spindle whorls are found in the Classic Hohokam sequences, Haury (1945:119) is able to point out that these artifacts have been found in the Flagstaff - Camp Verde area as well as elsewhere in Arizona and the New Mexico part of the Southwest. Haury (1945:121) seems to feel that a Mexican origin is indicated as a homeland since they seem to be a common artifact in remains there. Wasley and Johnson (1965:58) also conclude that they represent a Mexican introduction which would seemingly account for their presence throughout Arizona.

When Haury (1950:359) comments that spindle whorls are more common in Papagueria than in any other section of Arizona, he is able to avoid assigning them exclusively to the Classic Hohokam by creating a Hohokam-like peoples he calls Papagueria or Desert Hohokam (1950:14, 15). These would be the equivalent of the Ootam proposed by DiPeso (1956:559-567) and defined as an indigenous peoples living in the desert uplands distinct from the Classic or Riverine Hohokam.

Even though McGregor (1965:381) contends that spindle whorls are a trait that properly belongs to the Salado, it is apparent that spindle whorls are common during the Classic Hohokam time period, but are not an exclusive trait that they and only they possessed. Their upland neighbors on all sides were in possession of the same spinning tool.

It thus seems appropriate to confine the presence of spindle whorls as a time marker beginning with the Classic Hohokam time sequences but not to specifically define them as belonging exclusively to the Hohokam.

### Fortes

With regard to the fort-like sites found in this survey, the case against habitation and refuge seems very strong. There simply is no visible means of support in the way of crop growing space or water for people to survive for any period of time. If they were besieged, starving them out would be a simple task. Assault as such by any enemy force would be unnecessary. Lookout and signaling, plus consideration of religious ceremony seems the only logical answer left. To summarize their location, each is located on the crowns of high buttes in almost inaccessible locations, but each providing a lookout over habitation and farming property. In addition, each has a commanding view of the lower lands to the south and southwest and each can be seen from its neighbor.

The nature and extent of the hilltop structures or so-called fortresses identified in the Cave Creek drainage require evaluation as a possible diagnostic trait which might be useful in placing these peoples in their proper taxonomic category. Various speculations have been put forward as to their usage including defensive, ceremonial, agricultural and habitational. Page (1970:49) even goes so far as to propose a habitational use by a ruling class with the added possibility of religious ceremonies.

Mindeleff, Fewkes and Gladwin all seem to be in agreement as to their impressions as to what these sites mean in the archaeological record. All three comment that they are in every case located on high points overlooking tillable land with little or no habitational signs and each commanding a view up and down the streams making an inference of lookout or signaling points possible. Fewkes (1912:207) adds the possibility of protection as a characteristic but at the same time, agrees that each is visible from its neighbor for signaling purposes.

It is difficult to entertain the premise that warfare was present because the usual signs indicating this in the archaeological record are not present. Even Schroeder (1960:31) can find no evidence of hostility in the Verde Valley from A. D. 1125 on, nor does there seem to be anything present in the surrounding areas that would indicate pressure on the inhabitants. If a movement to the south was the result of crop failures and drought further north, the presence of defensive positions may have been property-rights measures on the part of a moving population making sure that later immigrants would clearly understand that there could be no room for them and they must keep on moving until they found an unoccupied place.

Such sites are not confined to the mountainous areas between the Agua Fria and the Verde Valley. Gumerman (1972-personal communication) reports that these fortified hilltop sites can be found all the way to the Bradshaw Mountains. Sauer and Brand (1931:114) confirm their presence throughout northwest Mexico. They also clearly refute the defensive fortress concept by speculating that they have been located along the ranges of hills as part of a signaling defense organization. Fontana, Greenleaf and Cassidy (1959:49) in describing their Black Mountain site in Southern Arizona raise the question of the purpose behind these fort-like sites and they also come up with the idea of their being part of an elaborate interconnected look-out and signaling system. They also confirm their occurrence as being widespread throughout southern Arizona and northwest Mexico.

While it has been shown that the hilltop fort sites are not confined to the Verde - Agua Fria drainages, examples can also be found to show equivalent widespread distribution for the fortified villages located in defense positions accompanied by Hohokam-like redwares and plain pottery. Wasley and Johnson (1965:65) describe such a site along the Gila River near Gila Bend. In their case, they called their site AZ T:13:8 (ASU); a Classic Hohokam manifestation based purely on the Gila Red and Plain pottery present without taking into account the architecture as being at variance with Classic Hohokam. Larson likewise classifies his Tumamoc Hill site outside of Tucson, Arizona as being Hohokam in origin. He dates the site in the period of A. D. 1200-1300 on the basis of pottery and proposes contemporaneity with a Classic Hohokam site located at the base of the hill. He seems to like the proposition of defense but falls back on the possibility of look-out signaling when no concrete evidence seems at hand to support the defensive theory.

Johnson (1963:184) goes so far as to link the Trincheras forts in northern Mexico with those in Arizona as being built to resist what he calls the "Salado" invasions. He is able to come to this conclusion by comparing the traits of the Trincheras cultures with those of the Desert Hohokam as listed by Haury (1950:547) and reflecting the whole as simply a manifestation of the Desert Hohokam. His inference is that these hilltop forts are not a trait of the River Hohokam.

Farmer (1957:249) attempts to bring order out of the difficulty of classifying such sites by ranking their relative locations and degree of apparent fortification. His study was based on examples of sites throughout Arizona including some from the Verde Valley. The four fort-like sites located in this survey could be fitted into Farmer's classification scheme but in doing so, the serious question as to whether they are really forts within his meaning of the term remains

unsettled. If a "fort" is intended to include usage as a place of refuge, then Schroeder (1957:237) leans to the fort concept for such sites as he proposes refuge as a hypothesis.

### Field Houses

The use of the term "field houses" here denoted temporary structures located adjacent to irrigated fields to serve as observation posts as well as storage for harvested crops. Since transit or commuting time between these habitation sites and the arable land would present a time-consuming workload for these peoples, the use of field houses would keep this to a minimum. Haury (1956:7) may have a better term when he refers to these buildings as "distant farm houses." The majority have only one room and are identified through the outline of boulders at the perimeter. These should not be confused with Schroeder's use of the term (1940:61) where his descriptions more closely match Mindeleff's stone villages. Even in 1896 Mindeleff is able to comment that the architecture in no way resembles anything to be found on the desert (1986:238) and infers an association with the Pueblo people to the north.

It would be interesting to find out just what kind of dwelling walls were erected on top of these boulder foundations. Schroeder (1953:184) finds that the Sinagua used the principle of burying posts in the walls as contrasted to floor imbedded post holes for the base of roof supports found in neighboring cultures. He is able to trace a movement south of this trait after A. D. 1150.

Woodbury (1961:32) prefers to use the term of "summer shelters" and/or "harvest time storerooms." Van Valkenburgh (1961:3) calls them boulder shelters. In any case, these field house-boulder shelters are common throughout the Cave Creek drainage. Turney (1929:156) confirms the presence along the Verde of these scattered single room houses overlooking cultivated fields as distance from so-called towns located in defensive positions. His Verde descriptions certainly match the remains located in the Cave Creek drainage. Since Wingfield Plain pottery has a wide time span it is extremely difficult to date these field houses precisely since other associated artifacts are almost nonexistent.

### Kivas (Lack of)

The absence of kiva remains in the sites located by this survey as well as in sites found along neighboring drainages needs discussion and possible clarification. Fewkes (1912:219 and 1898:574) is struck by the lack of visible kiva remains to the east in the Verde Valley. He suggests that their place may have been taken by a dwelling room but in any case, their absence, plus other differences with

the pueblos to the north reflects the possibility that a distinct culture area must exist here (he is referring to the Verde Valley). Mindeleff (1896:257) comes to much the same conclusion.

Through common usage the word "kiva" has come to represent a particular kind of architecture denoting ceremonial purposes. Specialized ceremonial rooms with few or no functions of a domestic nature is another way of expressing it. However, it seems prudent to point out that ceremonial rooms do not necessarily have to have the standard architectural features to perform the same services associated with kivas. Smith (1952:154) makes this clear in his work at Big Hawk Valley. Since there appears to be a larger than normal centrally located room in each of the sites in the Skull Mesa portion of the survey, the possibility should not be ruled out that a ceremonial purpose could be involved. While it may not be entirely correct to call such rooms "kivas," these peoples were so dependent on the correct interpretation of the seasonal weather fluctuations that they must have had ceremonially expressed beliefs regarding weather predictions requiring a meeting place.

Schroeder (1966:699) equates the Hohokam ball courts (as being community lodges) with the kivas of the Anasazi. He contends that the use of irrigated agriculture requiring intracommunity cooperation coupled with rituals to ensure crop success (1966:699) certainly require a meeting place. He goes so far as to suggest that the forts previously discussed might have also served such a purpose, although he does agree that the lack of kivas does not preclude the use of rectangular ceremonial rooms (1953:80). The large rooms appear as the most likely candidate for a place of ceremonial oriented conversation. Since nothing resembling a ball court or a kiva, as such, seems present in the Cave Creek drainage, it becomes possible to speculate that this absence suggests that neither a Hohokam nor Anasazi culture is present. However, such a speculation may require modification since Reed (1950:122) finds rectangular ceremonial rooms present in the Mimbres as well as in the Tularosa in the upper Gila and Salt from the ninth to thirteenth centuries.

## CHAPTER V

### Discussion

In the introduction, four alternative hypotheses were listed as possibilities for investigation during the course of the survey. The archaeological data gathered as a result seems to strengthen two of these possibilities at the expense of the others. In addition, a new hypothesis unrelated to the original four arose during the course of the survey and concerns speculations as to the manner in which the population pursued their agricultural activities. It is proposed to explore each hypothesis in the light of the surface manifestations observed during the survey as measured against published data by others.

Taking them in the same order as set forth in the Introduction, a comparison with the traits recognized as being riverine Hohokam should indicate whether a cultural affiliation existed with the Cave Creek assemblages. Since the temporal setting concerns the Classic period of riverine Hohokam any compatibility studies must take into consideration the Salado element present in the Hohokam sequences at that time. Both Gladwin et al (1965) and Haury (1945) consider the Hohokam Soho and Civano phases to be a mix with Salado traits representing either acquired traits or actual intermingling of peoples or both. Any discussion of Classic period Hohokam must consider the Salado participation in its cultural make-up. Using definitions of Hohokam and Salado from Haury (1945:207) and Gladwin et al (1965:264-269) the following comparisons become possible:

|                     | <u>Cave Creek</u>                         | <u>Hohokam</u> | <u>Salado</u>                              |
|---------------------|---|----------------|--|
| <u>Pottery</u>      | Paddle/Anvil                              | Paddle/Anvil   | Coil/Scrape                                |
|                     | Wingfield Plain                           | Gila Plain     |  |
|                     | Redwares                                  | Redwares       | Redwares                                   |
|                     |   | Red on Buff    | Polychromes                                |
| <u>Architecture</u> | Stone walled houses with contiguous rooms | Earthen walls  | Stones walled houses with contiguous rooms |
|                     | Compounds                                 |                | Compounds                                  |
|                     |   |                | Multistoried houses                        |

|                       | <u>Cave Creek</u>     | <u>Hohokam</u>                    | <u>Salado</u>         |
|-----------------------|-----------------------|-----------------------------------|-----------------------|
| <u>Agriculture</u>    | Intensive flood water | Controlled large scale irrigation | Intensive flood water |
| <u>Hill-top forts</u> | Yes                   | No                                | ?                     |
| <u>Spindle Whorls</u> | Yes                   | Yes                               | Yes                   |
| <u>Burials</u>        | ?                     | Cremated                          | Extended inhumation   |

A note of caution in assessing the importance of the above listed attributes concerns the variations in agriculture techniques. The lack of controlled large scale irrigation in the Cave Creek area does not necessarily reflect a difference in peoples but simply that Cave Creek with its seasonal water flows was not suitable for canal irrigation whereas the Salt and Gila Rivers with year round water were adaptable to such programs.

A cursory inspection of the above tabulation indicated that the Cave Creek peoples may have been a mix of Hohokam and Salado with Salado being more prominent than Hohokam. However, one variation stands out that is common to neither. The Cave Creek peoples made no painted pottery despite normal predictable percentages (Schroeder 1952:321). The Wingfield Plain found in abundance fits the description of Gila Plain but lacking the mica temper. Since Salado pottery has come to mean the coil and scrape polychrome variety as a distinct diagnostic trait, Salado as such seems to be ruled out as a possible source for the Cave Creek cultural manifestations since not a single Salado painted sherd has been found along the entire drainage.

It is unfortunate that the Salado/Hohokam sequences cannot be separated out from each other for comparative purposes more precisely than is currently possible. Confusion still exists as to just what Salado really means. Lindsay and Jennings (1967:4) were unable during the course of the Salado Redware Conference to have the conference produce a definition beyond the presence or absence of the diagnostic pottery style coupled with the absence of kivas and the presence of compounds and/or plazas.

McGregor (1965:365) contends that Salado is, in fact, a separate culture. However, this does not account for the part that the Gila redwares play in and are common to both the Hohokam and Salado cultures. He seems to dismiss this problem by citing the redware origin as being in the Flagstaff region before Classic Hohokam times.

His inference that the Salado should be treated separately from their neighbors, the Sinagua, is not completely tenable when his descriptions of the respective architecture are, in many cases, indistinguishable. Since he can also see Sinagua beginnings in Mogollon, it would appear that the two had at least common beginnings.

A case could be made for the Cave Creek remains to be classed as either Hohokam and/or Salado or for convenience's sake, simply Classic period Hohokam. The evidence of paddle and anvil pottery plus the redwares and Gila shoulders along with the spindle whorls, would normally be considered sufficient. However, the defensive type walled villages along with overlooking fort-like structures plus no painted pottery, indicates a sufficient variation to shelve positive definition as Hohokam until more evidence is forthcoming, or until a new evaluation of Hohokam can be made that will encompass the Cave Creek variations. The necessary evidence can only come from controlled excavation particularly in the lower sections of the creek where vandalism and desert traffic will all too soon result in the destruction of the evidence.

The second hypothesis concerned the possibility of the Cave Creek peoples being a part of the regional manifestation known as "Sinagua." The term Sinagua has been misused and abused as frequently as Salado and for much the same reason. Taxonomic semantics and practical sense sometimes do not go together. Before Sinagua, as a taxonomic name, can be used in reference to the Cave Creek assemblages, some definitions must be established. The definitions used here will then be measured against the Cave Creek attributes. This does not mean to say that the variations from these definitions used by others may provide somewhat different conclusions.

The first positive attempt to provide a cultural definition to these peoples was set forth by Colton (1946) when he selected the name of Sinagua as a taxonomic name-tag to separate the brownware pottery makers from the Hohokam. His criteria for the separation of the two is based exclusively on pottery differences. His definition of Sinagua thus revolves around a paddle-and-anvil technique employing smudge marks (1946:303). The validity of Sinagua as a culture thus becomes a matter of pottery identification if Colton's definition is used as a base.

Since Colton is the first to proposed the existence of Sinagua (1946), it is prudent to begin with his theory on the subject. His concept involves the Sinagua as a people moving out of the Flagstaff area (1946:304) down the Verde about A. D. 1125, with the movement lasting into the fourteenth century, into formerly Hohokam territory. He proposes that they brought dry farming with them and later accept-

ed irrigation as practiced by the Hohokam. Architecture, he contends, was acquired from the Pueblo people prior to the move. His explanation for the cause of the move south pertains to the drought ending circa A. D. 1200, forcing them to move down to lower elevations where water was more plentiful. In his opinion, these peoples who adopted so much of their neighbor's traits, have their origins in the Patayan peoples further to the west.

This theme was later picked up by Schroeder (1953:53) who, at that time, proposed that the Sinagua represented an outlying branch of the Pioneer Hohokam which was subjected to influences resulting from the rush of peoples immigrating into the Flagstaff area after the eruption of Sunset Crater in A. D. 1066. As a result, they acquired some traits from each of the new neighbors ending up with masonry walled architecture and local redware pottery. In other words, he contends that the Sinagua was formed through a population mix and the altered pattern moved as a new cultural complex into more southern areas (1953:80). At the same time, he tries to resolve the Salado problem by saying that there was no real differences between the Sinagua and the Salado except for the decorated pottery that is characteristic of the Salado.

Schroeder (1960:52) dismisses a proposed Mogollon affiliation, at least prior to A. D. 1070, for the Sinagua, presumably on the basis of the paddle-and-anvil pottery making technique. He then makes a case for the Sinagua being a Pioneer Period culture with antecedents in the Hohokam of that time with later period Hohokam traits not reaching the Sinagua until the A. D. 1070 period, when the Hohokam immigrants arrived to take advantage of the favorable agricultural climate resulting from the eruption of Sunset Crater. Although he admits to Anasazi contacts (1961:63) prior to A. D. 700, he proposes that contact was then lost because Anasazi traits occurring after that date simply do not appear in the Sinagua. By defining traits in terms of patterns instead of peoples, he leaves the door open for the possibility of regional variations in the same peoples to explain the different attributes present.

It is the period after the eruption of Sunset Crater that concerns the Cave Creek drainage assemblages since all the remains there are identifiable as belonging to the Classic Hohokam time period. It is at this time that the Sinagua begin to display the combination Hohokam, Mogollon, and Anasazi traits that are seen in the Cave Creek drainage. Sometime after A. D. 1120, these traits began to move down the Verde and related valleys towards Phoenix. Schroeder finds them in the Salt River Valley about A. D. 1150 (1952:333).

The evidence thus seems to indicate that these Sinagua were dry farmers who manufactured redware pottery by the paddle-and-anvil technique

and constructed small pueblos on elevated terraces after A. D. 1130. (Schroeder 1960:2). He reports that the boulder sites appeared at the same time with large pueblos not showing up until circa A. D. 1300. Their dry farming technique is reflected in the small garden plots outlined by rocks found throughout the Cave Creek drainage. He makes a case for the Sinagua always selecting elevated spots for their homes with their farmlands always being visible from the residences (1953a:81). It seems logical to connect the Cave Creek forts with this same concept as each seems to overlook both habitation and farmland areas. Thus the Cave Creek evidence certainly confirms this position. Boulder rooms or field houses are associated with these pueblos and in all cases are situated within probable or definable farmland. By 1960 he is further able to report (1960:24) that the larger pueblos after A. D. 1250 are usually spotted along streams, with the sides that had no unobstructed view being placed so that access was extremely difficult. In addition, those built after A. D. 1300 were always placed in defensive positions while those built prior to that time were converted into fortresses about that same time, even though they might have been as much as three km. removed from arable farmland (1960:37).

In the previous discussion it was deemed prudent to eliminate Salado and/or Hohokam as being responsible for what is present, archaeologically, in the area between the Agua Fria and Verde Rivers. The name-tag Sinagua coined by Colton and expanded by Schroeder would appear to do justice to the problem, particularly in light of the attributes assigned by these authors to the Sinagua. They most appropriately match what we see in Cave Creek.

Various origins have been proposed for these Sinagua ranging from Mogollon, Anasazi, Hohokam, Yuman, and Patayan. Schroeder carries this a step further and labels Colton's Sinagua as Hakataya which he equates with Yuman (1960:84). In doing so, he seems to destroy his hypothesis advanced in 1953 (1953a:81) where he relates the Sinagua and Hohokam to a common culture base despite the Mexican implication in the source of Hohokam culture. The use of the terms "same culture base" may not really be what he intended it to infer. The position would have been much clearer if he had simply left his "Hakataya" defined in terms of a Pioneer Period root as a result of Hohokam contacts, but basically a "folk culture" present from preceramic times affected by complex cultures in neighboring localities.

If, as Colton and Hargrave (1937:173) contend, the Alameda Brownwares represent an extension of Hohokam influence, then it follows that what Schroeder is doing is to link the peoples neighboring the Hohokam into a composite group he calls Hakataya purely on the basis of the way they made their pottery. However, Schroeder (1960:99) then disassociates Sinagua from the Hakataya when he states that the Sinagua as a complex culture collapsed--presumably after their trek to

the south--and reverted to their original Hakataya state. This leaves the Cave Creek Sinagua more or less up in the air. Did they go back up north to be with the Yuman types that survived into historic times, or did they join hands with the Hohokam-Salado who then, presemably, became the Pima-Papago? Again (1960:109) he talks about the Yumans living side by side with the Sinagua so there is no doubt that he wants to infer that they were, in fact, two different cultural entities. His relationships between the two gets further confusing when he proposes that the present day Yavapais are the descendents of the Bloody Basin, Verde Valley and Roosevelt Basin Hakatayas (1960:109) who retained some of their prehistoric Sinagua traits. In order to get to their present day location in the Verde Valley, Sinagua must have then retreated up the watersheds at the time of the supposed collapse around A. D. 1400.

A more logical solution would be to agree with Schroeder (1960:193) when he indicates that the pre-A. D. 700 peoples in the area under discussion were, in fact, Hakataya, defined as being an indigenous peoples who then became influenced during the 700 and 800's through contact with Hohokam from the south. The Sinagua then becomes a cultural designation to describe these peoples after further influence from the Hohokam, Anasazi, and Mogollon mix that developed around Sunset Crater circa A. D. 1100. The Sinagua then moved south leaving Schroeder's Hakataya to occupy their original territory.

So far nothing in this discussion has been mentioned concerning the possibility of Anasazi origins for the Cave Creek remains. The Anasazi position in this matter can be dismissed with certainty when a comparative study is made of the attributes associated with Anasazi as compared to those of the Sinagua and Cave Creek peoples. Reed (1964:187) is able to contrast the rather radical differences between the Sinagua and the Anasazi to the extent that consideration to Anasazi origins need no further investigation.

It is interesting to note the attributes that Reed in this same reference is able to ascribe to the Sinagua:

1. Pueblos of inferior masonry with no particular orientation.
2. No kivas but with a rectangular chamber larger than other rooms.
3. Polished smooth brown and red ware finished with paddle and anvil.
4. No painted pottery.
5. Burials--uniformly extended.

Since no excavation work was done in the course of the survey, burials as such could not be investigated. The discovery of extended burials in the Cave Creek area would help strengthen the Sinagua argument, versus the Anasazi burial practice of flexed inhumations and the Hohokam practice of cremation. However, since Salado burials have been found in the extended position this end of the argument must remain open.

The case for Sinagua as a discrete culture seems credible and it would be just as easy to assign the Cave Creek results to this culture as it has been for others to arbitrarily use Hohokam as a designation for the same type of remains. However, insofar as Cave Creek is concerned, there are two areas that do not fit into the Sinagua pattern. The first concerns the hilltop forts, with northwest Mexico as a likely source. Certainly a locale outside the scope of Sinagua territory. Hinton (1955) provides positive descriptions of such forts in the Altar Valley in Sonora containing Gila Plainware pottery. The other unresolved problem concerns the compounds found throughout the Sinagua-Salado-Hohokam area. These enclosures or courtyards appear in the Soho phase of Classic Hohokam. Smith (1952:171) takes the view that this is a trait that originated in the Hohokam area. At the same time, he can cite their presence in the Verde, Rye, and Tonto Creek areas at a time that precedes the advent of the Salado.

Cultural affiliations have thus been explored to compare the Cave Creek manifestations for possible assignment to the Sinagua, Salado or Hohokam phase sequences. Of the three, Hohokam seems the least acceptable with Salado being a possibility. However, so far Sinagua meets more of the criteria inherent in the Cave Creek remains and must be considered the current most likely candidate for cultural assignment. However, variations do seem to be present when the traits of each of the three cultures are applied to the Cave Creek evidence. Since this problem is still unresolved, it becomes necessary to explore the third hypothesis presented in the Introduction to the effect that there may be present a unique upland pattern of peoples which has not been adequately defined previously. The fourth hypothesis concerning the possibility that the Cave Creek peoples could have been influenced by interaction with their neighbors is difficult to separate for discussion purposes from the third since the answer to the fourth is dependent to a positive answer to the third. The problem becomes one of trying to separate out those traits which might be considered indigenous from those acquired from neighbors.

In the case of the Cave Creek survey, all the observed remains were as-seen on the surface of the ground and, obviously, represented those activities that were being carried out just at the time of the abandonment. In every case, each attribute that could be seen had a counterpart in one or more of the neighboring cultures. No sites and/or other evidence were seen that could have been called exclusively

independent or represented independent development. Excavation might reveal information that could be considered evidence that an independent culture was present but which later adapted cultural attributes of its neighbors. Certainly on the basis of the evidence found to date, there is no possibility of justifying the proposal that a culture has developed in situ, nor that a local indigenous population adapted the ways of its neighbors. Since all the attributes seem to have counterparts in other cultures, a logical hypothesis follows that what can be seen represents a movement of peoples into the area with their traits. This kind of reasoning is inductive, rather than deductive, but until positive evidence to the contrary can be established to show that only the traits moved, and not the people, such reasoning should be acceptable. The clarification of this problem will come from controlled excavation of the habitation sites located in the survey.

This same problem was encountered by Gunnerson (1969) when he tried to establish the origins of the Fremont culture (1969:170). In his case, remains of an indigenous culture simply could not be demonstrated in the archaeological record and he then concluded that the sudden appearance of many similar manifestations throughout a wide area reflected a movement of peoples. Since Hohokam characteristics have been found in the Verde Valley to the east and the Agua Fria to the west in the earlier Colonial and Sedentary phase periods (Schroeder 1963:15), the Cave Creek drainage certainly must have provided a habitation base for these Hohokam peoples during those times, making it difficult to presume that the Cave Creek area was uninhabited until the time represented by the observed remains. Just as Gunnerson (1969:180) finds that his Fremont peoples had as a base an indigenous population interacting with arrivals from neighboring areas, there is no reason not to believe that this same type of cultural interaction occurred in the Cave Creek drainage. Breternitz (1960:27) prefers to call this sort of interaction as a basic "folk culture" overlain by peoples and/or ideas migrating in from elsewhere. A certain dichotomy of traits seen during the survey might very well be explainable by such a premise.

Since all the traits observed in the survey are also observed in the neighboring cultures, an easier problem to resolve is whether the evidence represents interaction with those neighbors. The paddle and anvil pottery making technique seems the easiest to explain. Since Hohokam pottery makers were in the drainages to the east and west as early as A. D. 700 (Breternitz 1960:27) an indigenous population would certainly acquire this technique through association. The fact that they were less advanced than the Hohokam as evidenced by their inability to make painted pottery leaves no doubt that they were the imitators and not the originators. The lack of adobe walls should not be considered as a deviation in cultural significance since the Cave Creek area does not lend itself to adobe construction because of lack of suitable material and its rocky terrain. The pueblo type ruins in the upper reaches of the Creek reflect an Anasazi trait from the north. Here, again, the lack of orientation and the relatively inferior stone work again suggest imitators

and not originators. There seems to be no doubt that the Cave Creek, as were its neighbors the Agua Fria River and Verde River were diffusion areas receiving material culture and peoples from surrounding regions to the south and north.

As indicated earlier, a settlement pattern became evident as the results of the survey were tabulated and analyzed. Since the pottery associations between sites was almost exclusively Wingfield Plain, plus Gila and Salt redware, a high probability of contemporaneity was indicated. Assuming contemporaneity, the sites can thus be considered components of a single settlement system. Such a system would thus reflect the manner in which these peoples organized themselves in order to cope with their social and environmental situations.

Sites, and the behavior that occurred on the, existed in the context of two environments--social and natural. At the same time, they are not randomly distributed over the landscape, nor randomly distributed in space (Plog and Hill 1971:9). The relationship of sites in the settlement systems to the social and natural environment provides a positive measure of evaluating just why the sites are in the spatial positions in which they are found. Trigger (1969:66) analyzes this problem of settlement patterns in terms of economics. He considers that the overall density and distribution of populations in a region is determined to a large degree by the nature and availability of natural resources that are being exploited. Gabel (1967:1) says much the same thing when he reflects that every economy functions within a physical environment which provides the resources utilized by the economy at the same time as it presents certain limitations within which the system must be made to work.

Once the two distinct ecological zones present are examined in such a perspective, the possibilities of a settlement system become readily observable. One zone is mountainous with little agricultural potential, but displaying a community of villages adjacent to running water. The other zone has a great deal of arable land capable of being irrigated by canal diversion from Cave Creek, but not associated with habitation sites of a size and quantity compatible with the magnitude of agricultural potential present.

Assuming contemporaneity, it follows that the two zones were being explored by one peoples who lived in permanent villages upstream to the Paradise Valley sites to farm the arable land during the summer months. During these summer months, while engaged in farming activity, they lived on the site in field houses in order to oversee the activities necessary for the successful raising of their crops. The whole area was, in turn, overlain with a series of hilltop structures each capable of signaling its neighbors. Ceremonial purposes are also suggested for these hilltop structures.

Two prominent resources stand out as self-evident in the upper reaches of Cave Creek. They are year-round running water and site locations capable of easy defense. It is interesting to note that the habitation sites located on the first benches above the creek bed are the most solidly built with the thickest walls and each is situated on a steep bluff with extremely difficult access from the creek itself. The sites on the higher benches are less defensible and are not so solidly built but cannot be reached from the creek below without passing the thicker walled sites.

Assuming the lower elevation agricultural sites are, in fact, the farming locale of the peoples upstream who commuted to the scene of the farming activity, it is evident that the habitation sites were placed to take advantage of the on-the-site resources (i. e., water and defense) and at the same time, solving the problem of minimizing, insofar as possible, the effort needed to acquire critical quantities of food-stuffs. Meeting such criteria may represent what Judge (1971:38) refers to as maximizing resources acquired and minimizing the resource acquisition. In this case, the upstream sites should be termed living sites and the others as special activity sites. The combination is a series of sites whose locations are relevant to specific environmental variables and should be capable of being identified in terms of the identification of those variables.

Since the hypothesis postulates a settlement system, some form of integrated social system must have been in use. The cluster of sites in the Skull-New River mesa area total five in number with each occupying approximately an acre in size. All are hemmed in by steep vertical cliff walls at least 300 m. in height. Sites on the higher benches could only be reached by passing through the lower ones in order to reach the drinking water in the creek. The necessary allocation of the available water as well as the restricted collecting/gathering acreage available certainly presumes some form of social integration and organization in view of the population density involved.

It would be convenient to fall back on ethnographic analogies of other peoples to establish a case for living in one ecological setting and carrying out farming and other activities in another. Such analogies would be appropriate only if the reasons for the movement from home to work place were comparable. For example, the present day population in Yucatan and Guatemala may travel as much as twenty to thirty miles a day to work their fields (Heizer 1960:217). However, the reason for this results from the agricultural practice of slash and burn. Since a given field can only bear crops for one or two seasons at the most before lying fallow for four to six years, it follows that a farmer must keep moving further and further from his home base in order to have produceable land at his disposal. This situation is not comparable to the Cave Creek farming situation since the slash and burn technique was not necessary. Since the limited rainfall in this

part of Arizona does not leach out the chemical content of the soils as is the case in the tropics, it is conceivable that the requirement of having land become fallow in order to regain the necessary chemical balance might not have to be performed more than once a generation. Another example relates to the selection of habitation sites in accordance with ceremonial beliefs. In this case, the Acoma pueblo located on top of a mesa was so selected for a settlement site on the basis of its resemblance to ceremonial structures in Mexico (A. E. Dittert - personal communication). In the Cave Creek example, the evidence indicated that the habitation sites were selected for the purpose of being in the vicinity of an assured water supply which was also in a secluded protected situation. Any analogies, to be appropriate, would have to parallel these circumstances.

An important consideration in any evaluation of this problem concerns estimations of the numbers of peoples involved in the settlement pattern. Estimating the numbers of peoples represented by the habitation sites is extremely difficult. Numbers of rooms seen in the upper reaches of Cave Creek do not necessarily translate directly into numbers of peoples since there is no way to tell if all the rooms were occupied at the same time or if they were all habitation quarters. Reference has been made earlier to the possibility that certain rooms may have had ceremonial connotations. Cook and Heizer (1968:79) studied this problem with respect to the relationship of site size and population totals in California. Their approach concerned floor space utilization and resulted in a figure of twenty square feet per person assuming an average minimum number of people per household of six. Each additional person then required an increase of 100 square feet. This can be expressed another way by saying that as the number of people increase, the floor space in square feet per person approached a limit of 100. These two authors are quick to point out that the use of their statistics must be restricted to relatively uniform regions.

Naroll (1962:587) has tried ethnographic analogy to resolve this problem. Instead of statistics from uniform regions, he selected a wide variety of population concentrations from all the continents. His mathematical analysis shows that settlement population is roughly one tenth the floor area in square meters. Turner and Lofgren (1966) applied a novel approach to this problem. In their case, they postulated population size as function of the capacity of serving bowls and cooking vessels. However, ethnographic data and census observations were not considered or integrated into their results. Their important point was the demonstrations that individual household size seems to hold steady regardless of the size of the settlement.

In summary, examples of three different attempts at estimating populations size have been presented. Floor space, number of rooms, sized of cooking and eating vessels, each have a nonrandom relationship to population

size. However, their application to the Cave Creek survey results would be premature in the light of the relevant data available to date. Until contemporaneity of the sites can be established, any speculations as to population sizes would be dangerous.

Surface observations provide no indication that a change in settlement pattern, once established, ever took place in the survey area. The evidence suggests that peoples moved in, lived, and obtained essential foodstuffs for a period of time and then moved out. The hypothesis being presented is really a problem in establishing the manner in which they coped with and manipulated the environment during the time the drainage was occupied.

In addition to population size there are a number of other unresolved considerations. The first concerns the possibility of trade taking place between the Cave Creek peoples and their neighbors. If these peoples were living in proximity to the Hohokam/Salado, some evidence of trade should be evident. However, surface collections of pottery found in the course of the survey do not show enough intrusive sherds to constitute evidence of even a minimal amount of trade. As Trigger (1968:67) points out, peoples that cannot produce enough food to meet their requirements engage, by necessity, in trade. This line of reasoning would possibly suggest that the Cave Creek inhabitants did not need to supplement their foodstuff supply since the combination of dry and irrigated farming took care of their wants without recourse to outside supplies.

An equally important organizational problem that would not show up in the archeological record as such would be the procedure for the distribution and allocation of the irrigated lands in the lower elevation sites. Not only land usage would have to be distributed, but the products of the farming effort must have presented allocation problems as well.

The case for contemporaneity seems strengthened by relatively sudden abandonment that occurred throughout the southwest at the end of the thirteenth or early fourteenth centuries. Since the pottery finds along Cave Creek reflect dates close to these figures, it would be likely that the Cave Creek peoples became a part of the exodus. Danson (1957:110-118) discusses the abandonment of the east central portions of Arizona during this period and is able to show that sites at the end of the occupation were all defensively placed in situations not unlike the upper Cave Creek sites. Since the upper Cave Creek sites have two outstanding features of protection and water, but lack farmland, the premise of fear from enemy forces is difficult to defend. The available farmland was completely at the mercy of any raiding force that might have come along but the water supply was not. The evidence thus suggests that they were protecting their water supply but were not so

concerned with their agricultural necessities. If warfare is ruled out and drought is assigned the role of spoiler, then irrigated farmlands would be the first to go since food supplies could be maintained by reverting to the collecting/gathering economy that prevailed before irrigation was developed.

Danson's reference to drought can be supplemented by a great many similar examples. Gunnerson (1969:181) in his discussion of the disappearance of the Fremont peoples to the north, uses drought as the cause just as Danson has to the east. Haury (1949:211) uses drought as a possible explanation for the demise of the Hohokam/Salado populations in the Salt River Valley.

All of the hypotheses related to cultural affiliations as well as the one above are concerned with contemporaneity. All require that each complex of sites must be positively dated before they can be accepted or dismissed. Burials must be found that will reflect extended or flexed burial practices, as well as cranial deformations from cradle board application in order to help place these peoples in their proper niche with respect to their neighbors. Schroeder (1953:184) has suggested that the Sinagua placed wooden posts within the building walls of their habitation units and this premise could easily be proven and/or refuted during excavation.

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